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Telephone: MF 4505.

PRINTERS:

"RICHMOND CHRONICLE,"
Shakespeare St., Richmond, E.1.
Telephone: JB 2419.

MSS. and Magazine Correspondence should be forwarded to the Editor, P.O. BOX 36, EAST MELBOURNE, C.2, VIC., on or before the 8th of each month.

Subscription rate, in Australia and Overseas, is 24/- per annum, in advance (post paid).

Wireless Institute of Australia (Enquiries Division) Rooms' Phone Number is JA 3535.

WI BROADCASTS

All Amateurs are urged to keep these frequencies clear during, and for a period of 15 minutes after, the official Broadcasts.

VK3WI: Sundays, 1100 hours EST, simultaneously on 3575 Kc., 7146 Kc., and 145.9 Mc. Intra-state call-backs taken on 7050 Kc.

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AMATEUR RADIO

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

Published by the Wireless Institute of Australia, Victorian Division,
478 Victoria Parade, East Melbourne, C.2.

Postal Address: P.O. Box 36, East Melbourne, C.2, Vic.

EDITORIAL



REMEMBRANCE DAY CONTEST

August is the month every year during which the Wireless Institute of Australia holds its Remembrance Day Contest in memory of those Australian Amateurs who paid the supreme sacrifice in defence of our native land.

Held on the week-end nearest D-Day in the Pacific Campaign which heralded the cessation of hostilities in World War II., this Contest has increased in popularity in each passing year and is a marked symbol of respect for those who died that we may live.

Every year there is an increase in the Amateur participation indicative of the great interest the Contest enjoys from those who lived, and in later years the sons of Amateurs whose fathers have passed to the great beyond.

For the past several years the Wireless Institute of Australia has been privileged to have notable people in the Australian community record an opening address which has been played prior to the commence-

ment of the Contest. This had added dignity and respect to the Contest and to everything for which it stands.

This year, 1960, His Excellency the Governor of Tasmania, Lord Rowallen, K.T., K.B.E., M.C., T.D., is honoring the Institute by recording the opening address. The Contest commences at 8 p.m. (1800 hours) E.A.S.T. 13th August and concludes at 5.59 p.m. (1759 hours) E.A.S.T. on 14th August. The tape recording, which will be played over official W.I.A. Stations in each State of the Commonwealth of Australia, will conclude at 5.58 p.m. (1758 hours) on Saturday, 13th August, and for the following two minutes all Amateurs will be asked to observe two minutes' silence in respect to our late members of the Australian Amateur Service.

They shall grow not old as we that are left grow old,
Age shall not weary them nor the years condemn.
At the going down of the sun and in the morning
We will remember them.

FEDERAL EXECUTIVE.

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Secondary: 7,100 ohms per side C.T.
For driving 807s Class B Triodes
from S.E. or P.P. Driver.

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75 WATT MODULATOR

Many Amateurs are at a loss to know the best manner to obtain the audio power required to modulate their transmitters. A very good means to obtain 75 watts of audio is the use of 807s (or 1255s) in Class B zero bias. This article (and the following one) are reprinted from earlier issues of "Amateur Radio" that are now out of print.

A complete modulator unit with pre-amplifier was designed, built and tested as a prototype, and all relevant tests were made including actual operation with a 100 watt transmitter. The performance of the modulator was very satisfactory, after one or two modifications were made to the original circuit in order to produce the required frequency response. The pre-amplifier provides sufficient gain for most high impedance type microphones.

TEST RESULTS

The frequency response was taken overall from the input of the driver valve to the secondary of the modulation transformer, terminated in a resistive load of 10,000 ohms, and with 100 mA. d.c. through the secondary winding.

At full output of 75 watts the frequency response was within 1.5 db. from 200 to 7,000 c.p.s. The distortion present at full output over the frequency range was quite low and aural tests showed that the speech quality was excellent.

The response of the pre-amplifier stages can be modified to suit a particular microphone by altering the coupling condenser values and in the case of a crystal microphone by reducing the resistor value from grid to earth on the first valve. It will be noted that the low frequency response falls off below 200 c.p.s., the transformers being designed to aid in this respect.

Reduction of the high frequency response and harmonics produced by the negative peak clipping valve is also desirable, and can be achieved by the use of a filter or to a degree by a suitable by-pass condenser.

It is well known that speech waveform is of a very peaky nature, and this means generally that either a low average modulation level must be tolerated, or some means must be provided to overcome this limitation. Without suitable precautions, an increase of the audio gain above a certain level will cause some of the higher negative voltage peaks at the modulation transformer secondary to exceed the final r.f. stage d.c. plate voltage. This will reduce the effective voltage acting on

THE modulator circuit is based on information appearing originally in R.C.A. "Ham Tips," re-printed in "Amateur Radio" (August 1948) and "Radiotronics" (July-August 1949) showing a method of using 807 valves as zero bias Class B Modulators. Tests have proved that this system produces the results claimed and does this without the usual complications of bias and screen voltages, etc.

Considering the popularity and low price of 807 valves, this circuit has much to commend it.

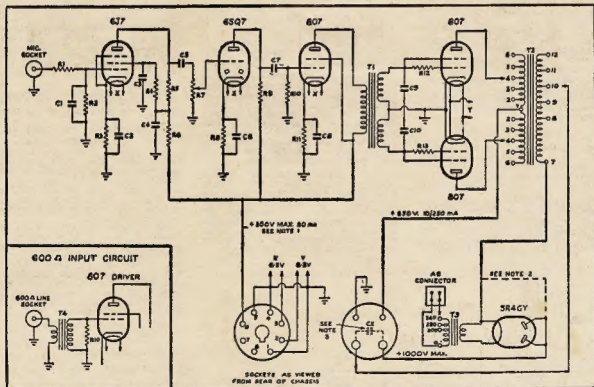


Fig. 1.—Circuit of 75 Watt Modulator.

CK—3,000 volt working, see text.

R1—20,000 ohms, $\frac{1}{2}$ w.

R2—5 megohm, $\frac{1}{2}$ w.

R3—1,500 ohm, $\frac{1}{2}$ w.

R4—1.5 megohm, $\frac{1}{2}$ w.

R5—0.25 megohm, $\frac{1}{2}$ w.

R6—50,000 ohms, $\frac{1}{2}$ w.

R7—0.5 megohm pot.

R8—5,000 ohm, 1 w.

R9—0.25 megohm, 1 w.

R10—0.5 megohm, $\frac{1}{2}$ w.

R11—225 ohm, 3 w.

R12, R13—20,000 ohm, 1 w.

NOTES

1. If voltage exceeds 300, reduce with a resistor and by-pass with an 8 pF. condenser.
2. Short circuit plates to filament if negative peak clipper is not required.
3. Up to 0.01 pF. by-pass may be required (inc. r.f. by-pass).

- T1—Type IT588 A. & R. Transformer.
T2— " MT15A " " "
T3— " MT1016 " " "
T4—600 ohm input transformer.
C1—50 pF. Mica.
C2, C3, C4—10 pF. 40 v.p.
C5—0.1 pF. 200 v.v.
C6—1 pF. 500 v.p.
C7—0.01 pF. Mica.
C8, C9, C10—400 pF. Mica.

the r.f. stage to zero for the period of time that there is no positive voltage applied, thus causing discontinuity of the carrier power and so-called splatter takes place.

Volume compression and a.m.c. circuits reduce the peaks and increase the average modulation, but the time constants normally used allow high speed speech peaks of some frequencies to pass through to the modulator output circuit. The solution to this is to add a high level negative peak clipping valve with a low pass filter following.

The negative peak clipping circuit is included in the modulator so that those who use the equipment will be provided with the basis for possible improvement of their transmissions if they desire a high average modulation level with minimum interference to other stations.

It is not claimed that the best results will be possible without a low pass filter between the modulation transformer and the r.f. final stage of the transmitter, although useful suppression of high frequency response can be obtained by providing as large a capacitance as possible (2,000 v.v.) in the position marked CX in the circuit.

A filter, if used, will carry the final stage d.c. current and the audio frequency currents. The condensers and reactors should be able to withstand the maximum working voltage continuously; i.e., approximately 2,000 volts r.m.s. at full audio output and 1,000 volts d.c. It is best to use "air core" reactors for the reason that less trouble will be experienced from noisy operation under heavy modulation.

Details of the design and operation of suitable filters, and of other methods of reducing the f.f. channel width will be found in "QST," April 1948; R.S.G.B. Bulletin, February 1949, and in other publications.

VALVE LINE-UP

The modulator includes preamplifier stages, and is intended for use with a high impedance microphone. The overall gain is more than sufficient for full output using a D104 type crystal microphone.

A 6J7 metal valve was used in the original unit, and should this type be difficult to obtain, a 6J7G would be quite suitable if provided with a metal shield to completely enclose the valve, grid resistor and r.f. filter circuit. A

single ended valve, such as a 6SJ7 is not recommended.

The second valve is a high gain triode type 6SQ7, and this valve and the following valves are readily obtainable.

It was found that a single 807 valve as a tetrode provided adequate driving power for the modulator valves, when used as shown in the circuit diagram. Negative feedback was not necessary, as the distortion visible on the c.r.o. screen was not excessive at 75 watts output, over the voice frequency range for which the unit was designed.

The driver transformer is a type specially designed for use in this circuit, but the modulation transformer is a semi-universal type suitable for use with many other Class A, AB1, AB2, or B circuits, using such valves as 807s, 809s, 830Bs, etc. The maximum signal modulator valve plate current should not exceed 150 mA. d.c. per side of c.t. on the primary side, and the d.c. current through the secondary should not exceed 150 mA. A maximum d.c. voltage of 1,000 may be applied to the primary and/or secondary windings.

MODULATION TRANSFORMER IMPEDANCES

PRIMARY	SECONDARY
1 H.T. +	7-8 4,000 ohms
2-2 3,800 ohms	7-9 5,000 "
3-3 5,000 "	7-10 6,000 "
4-4 6,800 "	7-11 8,000 "
5-5 8,500 "	7-12 10,000 "
6-6 10,000 "	

The modulation transformer is fitted with a spark gap to provide protection against excessive peak voltages which may occur in the event of loss or reduction of load during transmitter adjustment or tuning operations. This gap should be carefully adjusted so that during full modulation the points are as close as possible, but do not spark over under normal peaks.

The modulation transformer has been carefully designed and is not likely to break down with normal use if the maximum voltage and current ratings are not exceeded. The primary and secondary impedance ranges should be suitable for most modulator and transmitter valve combinations usual with a transformer of 75 watts rating.

POWER SUPPLY

It is necessary now to point out that full power output with low distortion from this or similar audio equipment, is not possible without power supplies having the necessary voltage regulation under minimum to maximum signal conditions.

The power supply for the pre-amplifier and driver stages should provide 275/300 volts at about 80 mA. with sufficient filament windings for all valves (except the 5R4GY). It is advisable to check the filament voltages at the valve sockets, as low voltage, particularly on 807 valves, is to be avoided.

The power supply for the modulator valves is most important, and should be a separate unit with good regulation. The voltage output should be approximately 650 volts at the no signal current of 10 mA. and should not drop to less than about 600 volts if full output of 75 watts is required, the maximum signal current for both valves being approximately 220 mA. It is possible to use up to 750 volts (maximum at no signal) on the valves, and obtain the power output with poorer power supply regulation. A power supply with good regulation and additional current capacity may also be used for both the modulator valves and the Class C final r.f. amplifier.

The degree of voltage regulation required can be obtained by using 888a rectifier valves, with a choke input filter (preferably a swinging choke) and a second filter choke, both with low d.c. resistance of the order of 50-60 ohms. The filter condensers may be 2 μ F after the first choke and 4 μ F after the second choke.

When wiring the modulator, make all earth connections to a bus-bar, and earth at one point only on the chassis.

MODERNISING THE DRIVING STAGES

The 6SQ7 can be replaced by a 6AV6 or one section of a 12AX7, and the 6J7 by a 6BR7 or EF86 or similar low noise pentode.

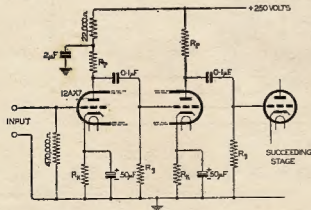
Alternatively the 6J7 and 6SQ7 can be replaced by a 12AX7 with both sections in cascade if the microphone has sufficient output.

Fig. 2 is from the S.T.C. Valve Data Handbook, Vol. 2. It is necessary to use separate cathode bias resistors and condensers and suitable plate decoupling. Plate and grid leads should be kept short and separated with shielding if required. For voice frequencies, the cathode and coupling condensers can be reduced in value to limit low and high frequency response.

★

Fig. 2.—12AX7 Cascade Amplifier

Cond. 1	Cond. 2	Cond. 3	Cond. 4	Cond. 5	Cond. 6
100,000	100,000	220,000	220,000	470,000	470,000
220,000	470,000	470,000	1M	1M	2.2M
1,500	1,500	3,300	3,300	6,800	6,800
27	31	35	33	28	23
2,000	2,430	2,940	3,370	3,420	3,580



DRIVING THE ZERO BIAS 807s

NOWADAYS it is quite common to have a contact on phone and hear, "I am using 807s in zero bias as modulators OM," and find another convert to using our "Maid of all work," the 807, in a new job.

This is quite understandable, for used in zero bias, the 807 is completely tamed, and parasites are non-existent.

For those who have not got access to the original article, it may be as well to run briefly over the circuit, shown at "A" in Fig. 1.

The centre tap of the driver transformer is grounded, and the ends of the secondary windings connected to the screens of the 807s. A 20,000 ohm resistor is connected between the screen and grid as shown, and the plates of the 807s are fed to the conventional modulation transformer. The cathodes of both 807s are grounded.

With this circuit, the driver transformer was the catch, as it had to match the driver tube to the grids of the 807s which had an almost constant impedance of 14,200 ohms, grid to grid. In addition, to obtain 120 watts of audio it was necessary to use a driver which would supply 5 watts of drive to the grids; this meant a pair of 2A3s or equivalent, after allowing for transformer losses, etc.

In our applications, 120 watts is not required, and therefore the most popular arrangement has been to use a 6L6G as driver, which allows us to obtain at least 75 watts of audio, and for lower audio requirements, a 6V6 or 6P6 was adequate. Obviously then, with zero bias 807s, the harder we drive them, the more we get out, up to their limit of 120 watts, provided of course, that our plate voltage, regulation, and impedance match are correct.

Ahead of the driver, we need the usual voltage stages to lift the gain from the microphone to give a voltage which will enable the driver to operate at its correct output. With a crystal microphone, this is about two stages, or with a carbon microphone, one stage would be adequate.

So much for the circuit as originally described, and now to the circuit described in February 1950 "CQ," shown in "B" Fig. 1.

T1 is a conventional plate-to-push-pull input transformer, such as the type used to feed a 6C5 to a pair of 2A3s; in other words, an ordinary voltage transformer (most of us have a transformer of this type lying about). The centre tap of the transformer is grounded, and the ends of the secondary fed to the grids of a 6SN7, which operates as two cathode followers. The cathodes are not grounded, but are connected as shown to the 807 screens and grids.

The plates of the cathode followers are tied together, by-passed, and supplied with 300 volts. The remainder of the circuit is the same as "A".

Conventional methods of producing driving power in circuit "A" Fig. 1 would involve power consumption largely cancelling the power economy advantages of the Class B operation. Such power need be supplied to each grid only on its positive half of the

cycle, however, the cathode follower driver is a natural.

Note there is no connection from the 6SN7 cathodes to ground, except through the grids and screens of the 807s. Thus the plate current flowing in the 6SN7s is equal to the grid and screen current of the 807s, and varies from less than 1 mA. to peaks of 20 mA. with voice modulation. Actually the total current of a 6SJ7 pre-amplifier, 6SN7 two stage resistance coupled triode amplifier, and the 6SN7 cathode follower stage totals less than 10 mA. under static conditions. Since the driver section works on about 250 volts, its plate power as well as that of the two voltage stages is obtained from the one supply.

Actually the direct-coupled cathode followers supply approximately 10 volts of positive bias with resultant total static plate current on the 807s of 30 mA. Of course with modulation, this plate current increases to 80 to 150 mA., depending on the output required.

The voltage stages required ahead of T1 are important, and it is necessary to see that sufficient voltage is supplied to the primary of T1, otherwise the power output from the 807 stage will be inadequate.

It is recommended that the minimum required from a crystal microphone would be: a 6SJ7 high gain amplifier, followed by two triode sections of a 6SN7 as resistance coupled triodes. In the writer's case the voltage stages used were:

Pre-amplifier on operating table, 6SJ7 and 6J5 to 500 ohm line. 6SN7 as two resistance coupled amplifiers, feeding T1, cathode followers and then the 807s Class B stage. From the 500 ohm line, all other stages are in the main rack of the transmitter. With this line-up, the gain control is one-fourth on for 100% plate modulation of a 50 watt power amplifier, i.e. 25 watts of audio. The meter reading the combined plate currents of the 807s varies from a resting current of 30 mA. to about 80 mA. on peaks, which means that for 25 watts of audio, the 807s are simply loafing along. The plate to plate im-

pedance was 10,200 ohms, and the plate voltage 500 volts, rather poorly regulated.

IMPEDANCES OF CLASS B STAGE

The following plate to plate impedances for the 807 Class B stage are appended for readers who have not a copy of the original article.

Case	1	2	3
Plate Volts . . .	750	600	500
Plate to Plate load	6650	5050	4000 ohms
Output	120	90	72 watts
Max. av. anode current (two valves)	240	240	240 mA.

NOTE.—If the Class B stage is run at lower plate currents or voltages, the plate to plate impedance will be different. The calculations are very simple with the following method, which is accurate enough for our requirements.

CALCULATING IMPEDANCE

In a Class B stage at any instant the grid of one tube will be driven positive and the other tube driver peak cut off, and therefore in calculating impedances we need only consider one tube. As far as the one tube is concerned the primary of the output transformer is a resistance and therefore we have this plate load (R_p) and the resistance of the Class B tube in series across the power supply. We can assume that about 80% of the power supply voltage will appear across the plate load R_p , as audio voltage, so if our plate supply is 500 volts, 400 volts peak of audio will appear across the plate load R_p . This gives us our voltage for calculation.

Now we want the peak current. Manufacturers' characteristics give the maximum average current for two tubes (sine wave input), so to find the peak current we divide the average current by 0.636. Therefore our peak current for Case 3 in the lists above is—

$$240 \text{ mA.} \div 0.636 = 377 \text{ mA.}$$

$$= 0.377 \text{ Amp.}$$

Then from $R = E \div I$ we have—

$$400 \div 0.377 = 1061 \text{ ohms for one tube.}$$

The plate to plate load for two tubes will be four times this value or 4244 ohms, which is very close to the Manufacturers' ratings (Case 3).

The audio output can be found by the simple formula $W = (I \times E) \div 2$ and working on peak values found, we have $(0.377 \times 400) \div 2 = 75$ watts output.

Below is the case of Class B 807s to give 100% modulation of a 50 watt carrier (25 watts of audio). Example—Supply voltage 500 volts.

$$\text{Av. plate current (2 tubes)} = 100 \text{ mA.} \\ = 0.1 \text{ Amp.}$$

$$\text{Then } E \text{ peak} = (500 \div 1) \times (80 \div 100) \\ = 400 \text{ volts.}$$

$$\text{(i.e. 80\% of supply voltage.)}$$

$$\text{Peak current } I_p = 0.1 \div 0.636$$

$$= 0.152 \text{ Amp.}$$

$$\text{Plate impedance (one tube)} = E_p \div I_p \\ = 400 \div 0.152 = 2630 \text{ ohms.}$$

$$\text{Then plate to plate impedance} = \\ 2630 \times 4 = 10,520 \text{ ohms,} \\ \text{and audio output} = (I_p \times E_p) \div 2 = \\ (0.152 \times 400) \div 2 = 30.4 \text{ watts.}$$

—J. C. Duncan, VK3VZ

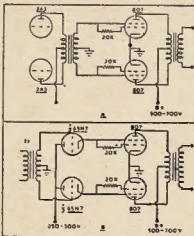


Fig. 1.

USING OVERTONE OSCILLATORS

RICHARD J. HEIGHWAY,* VK3ABK/T

CRYSTAL oscillators, operating in overtone modes, have been a feature of many circuits in overseas publications for some years. However, the adoption locally of this useful oscillator arrangement has been confined mainly to v.h.f. converters, where elimination of interfering signal injection within the i.f. tuning range has been the main consideration. Even in this application some difficulty has been found in the adjustment of the correct operating mode, and the following discussion is an attempt to describe the various circuit arrangements, and a method for making them overtone.

The fundamentals of this type of oscillator have been described by others,^{1,2} but a resume may help to explain the adjustment procedure. The familiar quartz crystal will resonate on numerous frequencies due to the various modes of mechanical motion which can be brought about by electrical stimulation. However, these resonances are far enough apart to make operation on one at a time possible, with high Q circuit constants.

The frequency of oscillation of a crystal will depend on whether it is series or parallel resonant. Fig. 1 is the equivalent electrical circuit of a crystal in a holder, where L, C and R comprise the series impedance and C1 is the combination of the capacity formed by the electrodes and crystal and the crystal holder. The series resonant frequency is therefore

$$F_s = \frac{1}{2\pi\sqrt{LC}}$$

and the parallel resonant frequency is given by

$$F_p = \frac{1}{2\pi\sqrt{L((C \times C_1) + (C + C_1))}}$$

From these equations it is seen that the series resonant frequency is lower than the parallel resonant frequency.

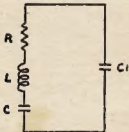


FIG. 1.

Overtone oscillators make use of this series resonance as the crystal is part of the feedback loop, or in the case of the bridge oscillator,³ one arm of the bridge.

It follows that the feedback frequency F_p , and so NF_p , where N is harmonic extracted, will be lower than F_o (or NF_o) in a parallel resonant circuit. Figs. 2 and 3 shows the a.c. circuits of two common configurations, the grid resistors being included as an aid to later description.

In Fig. 2 feedback from the anode circuit to the grid is by inductive coupling, maintaining correct phase relationship in the transformer connections, with the crystal in series resonance. Fig. 3 shows feedback voltage taken from a point 180 degrees out of phase with the anode of the tube, giving the required in phase voltage at the grid.

Resistor R in this circuit is necessary to raise the feedback point above earth, an r.f. choke would do the same, and it also provides a control over the voltage at this point. In each case the amount of feedback must be adjusted, and this is done by moving the grid coil in relation to the anode coil in Fig. 2 and in Fig. 3 by varying the ratio of the values of the two capacitors.

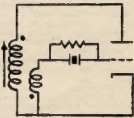


FIG 2

It should be noted here that the greater the amplitude of vibration of a crystal, the less stable is the frequency and only sufficient feedback to maintain reliable oscillation should be used. The crystal in each circuit provides a low impedance path at the series resonant frequency, or n times the frequency, and with Q_s in the range of 10,000-100,000, depending on the type of cut, feedback at intermediate frequencies is negligible. The grid resistor in Fig. 2 being across the crystal will lower the Q and make the feedback path less selective, so using a low activity crystal could mean less reliable operation. The activity of a crystal is checked by using a g.d.o. and the method described by VK2OA, or with the crystal inserted in place of the g.d.o. coil, comparing the meter deflection with a known good crystal, or specially cut overtone type.

So much for why they work; now, how do we get a particular circuit to over-tone? First of all the anode circuit must be tuned to the desired harmonic using the indispensable g.d.o. A v.t.v.m. connected via a 1 meg. resistor to the grid of the tube, or a milliammeter in series with the grid resistor if a v.t.v.m. is not available, is used as an indicator.

With loose coupling in the case of inductive feedback and minimum capacity at C in the capacitive voltage divider system, the usual supply voltages are applied to the circuit. By adjusting the feedback to the point where maximum voltage (or current) is indicated by the meter, the circuit will over-tone on the desired frequency. The anode circuit tuning is then peaked to give maximum output.

Due to the fact that the feedback loop introduces capacity across the

anode circuit, any adjustments made will affect the anode tuning, especially in the circuit of Fig. 3 where the shunt capacity is usually greater. Care should be taken to ensure that C1 does not become too small, resulting in insufficient feedback voltage to give reliable starting. This can be checked by switching the h.t. off and on several times while watching the grid meter, or listening to the beat note between the overtone signal and a receiver b.f.o. If oscillation does not commence immediately after switching on h.t., the anode circuit should be detuned slightly on the high side of the harmonic frequency, and the feedback coupling or capacity increased, once more aiming for maximum grid current or voltage.

When the circuit is over-toning correctly there will not be oscillation at the crystal fundamental frequency, such output ceasing at about the same time as the overtone starts. Maximum grid voltage or current does not correspond to maximum output, or minimum anode current,⁴ both of which fall close to the critical point where the circuit ceases to over-tone.

Using the circuit of Fig. 3 a recent check of about twenty assorted crystals, including several ex-Japanese, and some of rather doubtful origin, produced strong overtone oscillations in almost every one.

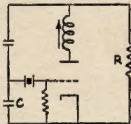


FIG. 3.

The only exceptions were when the holder contained a broken crystal, or none at all. Some crystals showed only weak attempts at oscillation, until they were cleaned by scrubbing with a toothbrush and warm soapy water, being sure to remove any small patches of metallic deposit on the crystal where the electrodes make contact. The above checks were made using one half of a 12AT7 coupled via a 47 pF. capacitor to the grid of the second half, and a 1 meg. grid resistor. The following conditions applied: E_a , 200v., I, 6 mA., and E_c -14v.

Overtone circuits have been installed in test oscillators, 144 Mc. converters for radio club members, and portable transmitters for 144 and 288 Mc. with excellent results, and could no doubt be used in many other instances.

REFERENCES

- 1 Duncan, J. C., "A.R.", Nov. 1954.
- 2 Winch, R. M., "A.R.", Aug. 1958.
- 3 Terman Radiol. Engineer's Handbook.
- 4 "Application of the Electronic Valve," Philips Technical Library; Book IV.

* 22 Leonard St., Belmont, Geelong, Vic.

CV and VT (U.S.A.) Service Tubes and Equivalents

VT	Commercial Type	CV	VT	Commercial Type	CV	VT	Commercial Type	CV
27	30	604	109	2061	1798	183	1R4/1294	
28	24A	936	112	6AC7	690, 747, 846	184	VR90	3799
30	201A	750	114	5T4	1846	185	3D6	2710
31	31	947	115	6L6	1948	188	7E8	891
33	33	949	115A	6L6G	1947	189	7F7	893
36	36	1775	116	6SJ7	591	190	7H7	895
38	38	712	116A	6SJ7GT	592	192	7A4	1770
44	32	711	116B	6SJ7Y	866	193	7C7	1777
45	45	596/610	117	6SK7	1981	194	7J7	897
46	866	32	117A	6SK7GT	1982	196	6W5G	
46A	866A		118	832		197A	5Y3GT/G	
47	47	1772	119	2X2		198A	6G6G	1928
48	41	608	120	954	1095, 1579	199	6SS7	1993
56	56	611	121	955	1050	200	OD3	686
57	57	612	124	1A5GT	756	201	25L8	522
58	58	613	125	1C5GT	1805	201C	25L6GT/G	
65	6C5	582/1649	126	6X5	573	202	9002	664
65A	6C5G	581	126A	6X5G	572	203	9003	668
66	6F6	1186, 1911, 1912	126B	6X5GT	574	204	3C24	789
66A	6F6G		128	1630	2715	205	6ST7	1896
68	6B7	1711, 1891	130	250TL		206A	5V4G	729
69	6D6	1900	131	12SK7	543	207	12AH7GT	529
70	6F7	1915	132	12K8	703	208	7B8	
74	5Z4	1864	133	12SR7	700	209	12SG7	694
75	75	614	134	12A6	526	210	184	783
76	76	615	135	12J5GT	535	211	6SG7	1978
77	77	616	136	1625	659	212	958	650
78	78	2544	137	1620	1755	213A	6L5G	662
80	80	617	138	1629	1756	214	12H6	916
83	83	618	139	VR150	216	215	6E5	1906
84	84/8Z4	619, 2548	144	813	26, 177	217	811	628
86	6K7	1942	145	5Z3	1861	218	100TH	2551
86A	6K7G	1941	146	1N5GT	1823	220	250TH	2589
86B	6K7GT	1943	147	1A7GT	1802	221	3Q8GT	
87	6L7	1951	148	1D8GT	1811	222	884	647
87A	6L7G	1950	149	3A8GT		223	1H5GT	1820
88	6R7	1963	150A	6SA7GT	1967	224	2C34	
88A	6R7G	1962	151	6A8G	578	225	307A	2612
88B	6R7GT	1964	151B	6A8GT	580	226	3EP1	817
89	89	833	152	6K6GT	1940	229	6SL7GT	1985
90	6H6	1301, 1930	152A	6K6G	1938	231	6BN7GT	1988
90A	6H6GT/G		153	12C8Y		233	6SR7	867
91	6J7	1074, 1936	161	12SA7	537	237	957	2700
91A	6J7GT	1937	162	12SJ7	697	239	1LE3	
92	6Q7	588	163	6C8G	1896	241	7E5	890
92A	6Q7G	587	164	1619	723	243	7C4	2706
93	6B8	1894	165	1624		244	5U4G	575
94	6J5	1067, 1933	107	6K8	1945	245	2050	2721
94A	6J5G	1932	167A	6K8G	1944	246	918	2692
94D	6J7GT/G	1934	168A	6Y8G	515	247	6A97	1882
95	2A3	1831	169	12C8	531, 837	248	3CP1	
96	6N7	1957	170	1ESGP		250	EF50	1578
97	5W4	1849	171	1R5	782	252	923	
98	6U5/8G5	504	172	1S5	784	254	304TH	2611
99	6F8G	1917	173	1T4	785, 1971	259	829	632
100	807	124, 1060, 1364, 1374, 1572	174	3S4		260	VR75	3796
100A	807 Special		175	1613	655	264	3Q5	819
103	6SQ7	1990	176	6AB7	661, 1873	266	1616	056
104	12SQ7	546	177	1LE4	780	268	12SC7	572
105	6SC7	1969, 2716	178	1LC6	778	269	717A	3594
106	803		179	1LN5	781	286	832A	768
106	803		180	3LF4		287	815	2663
107	6V8	510	181	7Z4	1790	288	12SH7	922
107A	6V6GT	509	182	3B7/1291		289	12SY7GT	668

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MT105

Amateur Radio, August, 1960

Reporting—As Distinct From QSL'ing

WITH the publication of Barney Smythe's article on QSL'ing in January "A.R.", I am relieved of the task of cranking this subject, together with the facts of personal reporting, into one article. WIA-L2001 has covered his subject well and there is not much which can be added to it. One point which I would like to emphasize, however, is the design of cards. An eye-catching card will work wonders for a non SWLING Amateur, that is provided the card is filled out correctly as emphasized by a case concerning one of my American friends, Gerry Andrew, W1/T899.

Gerry is one of that country's leading listeners and seeing-eye to blind Ham WINLM. Gerry is a chap in his 40's, who has not been a listener terribly long by BERS195 standards, and in fact has sent out only 600 cards in his life. But he has 180 countries confirmed and has reports out to another 130 from which, if he receives his usual 70% return, he should have confirmations from a very large number of countries in a very short time.

Designing his own card and letting his head go as regards information contained therein, this keen listener has earned the praise of many Amateurs who have received a report from him. So impressed have some chaps been, that they broke their life-time rule of not answering s.w.l. reports, to give this chap a card and to congratulate him on a well-set out card. The part that interested me most was the fact that his card contains little more than WIA-L2001's, but most of the required information is printed on the card. Moreover, it is one of those glossy American efforts and is certainly eye-catching.

However, that is not the subject in hand, and we must push along. Barney has covered the reporting by card, which is the only system we can use here in the Bureau. However many of us prefer to send a report which contains information other than that required on a QSL card and that information is the subject under discussion here.

When sending a report direct it appears to me to be a waste of postage to send just a card, when a fully informative report would be of far more value to the recipient than a plain card giving the bare facts of a contact. It is of course very nice to know that you are getting somewhere you did not anticipate, but far better to know in just what manner your signals are reaching that point.

Assuming that the listener feels justified in sending his report to the Amateur concerned, he starts out with the essential items of the basic report, date, time (preferably in GMT), band, mode of transmission, antenna in use, rx, station in contact with, and above all the signal strength, readability and tone if a c.w. station. This portion of the report is widely misused by listeners and Amateurs alike, who don't go into the misuse of the RST code by Amateurs (for you can find out all about that in any contest), but my concern here is that the s.w.l. should use the correct ratings when reporting.

Remember, if an Amateur has a signal of strength 5, he does not want to be told it is strength 8, and I am quite sure he would like to know if his c.w. had got down to 7 in tone rather than be told it was T9. But I am a little ahead of myself here.

What is this RST system? It is a means by which we can identify the state of a signal, R for readability, S for strength, and T for the tone of a c.w. transmitter.

There are five stages of readability:

- 1—Unreadable,
- 2—Occasional words only,
- 3—Readable with difficulty,
- 4—Readable with little difficulty,
- 5—100% copy.

With signal strength, there are nine stages, and I won't enter the usual controversy on S meters:

- 1—Faint,
- 2—Very weak,
- 3—Weak,
- 4—Fair,
- 5—Fairly good,
- 6—Good,
- 7—Moderately strong,
- 8—Strong,
- 9—Very strong.

There are also nine stages of tone for c.w. transmitters:

- 1—Rough hissing note,
- 2—Very rough a.c. note,
- 3—Low-pitched a.c. note,
- 4—Rough a.c., but slightly musical,
- 5—Musically modulated note,
- 6—Slight whistle,
- 7—Almost a d.c. note, some ripple,
- 8—Good d.c. note, faint ripple,
- 9—Pure d.c.

As well as this, if the c.w. note appears chirpy, add C after the report; should there be key clicks, add K; and if the note appears to be crystal controlled, add X.

By working strictly to this international system, and always giving a true report, you will do much towards ensuring that high percentage of returns. Do not be bashful about giving a bad report or pointing out a fault for most chaps will welcome such information, particularly if their contact has not mentioned it. They can then rectify the trouble and put a clean signal on the band. Of course there are those few who put a rough c.w. signal or an over-modulated spluttering phone signal over a large portion of the band. These guys should be told long and often. You won't offend them, for they cannot be offended and could not care less. Very fortunately we do not often strike that type of chap too often in Australia.

One final word of warning, do not chip a fellow for bad operating. You probably would not do as well yourself, and in any case he has not had a great chance to learn if he is a newcomer. Facilities just do not exist for training new operators. Clubs certainly teach theory and there are plenty of slow Morse broadcasts about, but the individual is usually left to his own devices when it comes to operating.

Another little point worth mentioning is your receiver description. If you

have an American set, it will usually suffice to refer to it by its designation, BC342N, or such, but many of us have AR7s, etc., which to a DX man in a foreign country would mean very little. I find it more satisfactory to refer to it by its title, with a short description of the various stages and anything which you may consider is of interest.

I would like to add here that it is not necessary to worry about using any foreign country than English in your report, as it is readily understood by the majority. If not, it is not hard for them to have it translated, particularly if you use a considerable amount of Ham jargon.

An accurate description of your antenna, together with its length, height and direction, whether or not an antenna coupler and preselector are used is most necessary to ensure a complete informative report. Interference (QRN) and its type, whether local or otherwise, atmospheric (QRN) and fading (QSB) of a slow or rapid nature, together with particulars of other stations operating on the band are all of the utmost importance in compiling a comprehensive report. It is advisable also to mention your current weather conditions.

To most Amateurs a report of this nature would be considered adequate, but our very good friend, Maurice Cox, WIA-L3055, goes even further. His very colorful card bears all the above information on its reverse side. However, as well as this he writes a personal note using the official VK3 report form, giving extracts of items which he heard the Amateur mention. This is final proof that he actually heard the contact which he is reporting. He always asks if the report is useful and if the station requires further reports. Appreciation of Maurice's reports can be summed up in a letter received from a VK3 DX man.

It appears that this chap never QSLs to s.w.l.'s, but the report was of benefit to him as he was being received off the side of the beam.

Speaking from my own experience in respect to sending personal reports, I find the response much the same as that of my good friend. The majority of my QSLs go out as normal cards due to the large number handled (when I am really operating), but nevertheless, I do send out many VK reports direct, in which case I always enclose a personal note. However, mine usually are to chaps who are having trouble, or who are testing a transmitter. I have hundreds of cards here in the proverbial shoe box, but there is one which I have displayed very prominently on the door of the cabinet containing my gear. I heard this chap testing his transmitter one afternoon not so very long ago, so I spent a little time noting various characteristics which would interest him, and sent a report with the usual card and stamped addressed envelope. I received a reply by return mail and I am sure Perc VK3OZ, to whom the report was sent, will not mind being quoted: "Tnx Don for a very informa-

(Continued on Page 11)

S.S.B.—HOW? WHY?

K. R. POUNSETT,* VK2AQJ

MORE and more Australian Amateurs are becoming interested in and recognising the wonderful advantages of Single Side Band, so that those of us who have been using this mode for some time have become the targets for many questions. Let me hasten to say that we do not mind these queries in the least. Here are some of the questions which seem to crop up again and again with my answers to these problems.

Q1: Why go to all that trouble to transmit voice when a.m. can do it simpler?

A: Single side band is a little more complex, but it does transmit voice much better than a.m. In fact, four times better for the same power in the antenna and given a selective (3 kc. bandwidth) receiver at the other end, eight times better. It eliminates the carrier, the greatest single cause of interference that exists today, and halves the bandwidth of the transmitted signal, a point well worth considering now that we are to lose some of our band space. It is not subject to selective fading. The initial cost of a sideband transmitter is less expensive than an a.m. transmitter of comparable output as there is no expensive modulator to provide. The final amplifier need be the only transmitting type tube in the equipment, this saves on the power bill, too.

Q2: Do I require a special receiver to copy sideband?

A: Certainly not! S.s.b. can be copied on a regenerative receiver, believe it or not. However, there are a few basic requirements that your receiver should meet, and these do not only apply to an s.s.b. receiver. The receiver requires a smooth tuning system, a slow tuning rate and practice. The oscillators in your receiver must be stable and you need to be able to vary your beat oscillator frequency to each side of the intermediate frequency. If you use a diode detector, the b.f.o. injection needs to have a fairly high amplitude. It is preferable to have the r.f. and audio gain controls separate.

Q3: What is the correct method of tuning sideband?

A: This problem is probably the biggest objection raised by the newcomer to s.s.b. This question has been answered in this and many other publications but once more will do no harm. There are two simple ways of tuning sideband: signal-frequency carrier injection and intermediate frequency carrier injection. When using signal frequency injection, the carrier oscillator must be very stable and must not overload the receiver. The v.f.o. or frequency meter (e.g. BC221) may provide the carrier or you can build a separate oscillator for the purpose. With this method, drift in the receiver does not effect the intelligibility of the signal unless the drift is excessive, but drift in the carrier oscillator certainly will.

The receiver is set up to receive a.m. and the sideband signal is centred in the i.f. bandpass for maximum "duck-talk" or maximum deflection of the S meter. The carrier oscillator is then slowly tuned across the s.s.b. signal until a point is reached where the signal becomes readable. If the a.m. transmitter v.f.o. is used for this, it will ensure that both stations are on the same frequency.

The b.f.o. method seems to be the most popular. Tune in the s.b. signal as for a.m. as already described. Reduce the r.f. gain, increase the audio gain to near maximum and turn off the a.v.c. Switch on the b.f.o. and, using the r.f. gain control to adjust the output level of the rx, S-I-O-W-L-Y turn the b.f.o. pitch control from one side to the other until the signal becomes readable. Note this b.f.o. setting and when tuning signal at that band, always use that setting and tune only with the main dial. The general rule is that lower a.s.b. is used below 10 Mc. and upper s.b. is used above.

Tuning single side band takes practice and after a little experience you will wonder how you ever had difficulty. However, if you still cannot make head or tail of sideband, Man, you have a receiver that requires your careful and urgent attention.

Q4: Why are some sideband signals harder to tune than others?

A: The ease of tuning a sideband signal is directly proportional to the cleanliness (i.e. good sideband and carrier suppression, lack of distortion, stability) of the signal.

Q5: How can I zero-beat my a.m. receiver to the frequency of the s.b. station that I wish to contact?

A: The lack of transmitted carrier seems to be the trouble here, but a little thought will reveal that when the s.s.b. signal sounds natural, the receiver b.f.o. is in zero-beat with the carrier that is not there. I know that this sounds rather Irish, but nevertheless it is true. You zero-beat your v.f.o. with the receiver and you are now on the same frequency as the s.b. station.

Q6: Why do s.s.b. stations sometimes seem to have excessive width?

A: There is no doubt about it, a few s.b. stations do have rather wide signals, due to improper operation, but somebody soon tells them about it, sidebanders are a very critical lot. However, there is often another explanation. Most of us, when using our receivers for a.m., run them with the r.f. gain full on and the a.v.c. on. The receiver has little selectivity in the r.f. stage or stages so that when a strong sideband station is operating within 25 kc. or so, it may, due to the high signal level, overload the front end. At the same time, a.v.c. action takes place, causing the gain of the receiver to fluctuate at an audio rate, the result being very similar to splatter from an over-modulated a.m. transmitter. This effect is not apparent with adjacent

a.m. stations as the steady carrier causes the a.v.c. to hold the receiver gain to a constant level.

The cure is very simple. Switch off the a.v.c. and reduce the r.f. gain in a bad case, although just reducing the r.f. gain usually has the desired effect.

Q7: I built a product detector into my receiver, but it doesn't seem to work properly. Why?

A: This is a very common complaint. The product detector is used to mix the s.s.b. output from the i.f. channel with the b.f.o. injection and give audio output. When b.f.o. injection is removed, all output should cease but often this is not the case. The trouble can usually be eliminated by decreasing the i.f. signal input to the product detector. Excessive signal input to the product detector causes refection to occur and true mixing does not take place. Try a 2 pF. coupling capacitor between the i.f. and signal grid and a 100 pF. from grid to ground. The b.f.o. injection should be about two volts r.m.s. while 0.2 volts r.m.s. is adequate from the i.f. channel. My favourite product detector is the Crosby three-triode one.

Q8: Which is the better method of generating s.s.b., the filter or phasing method?

A: This is a matter of personal choice and the availability of parts. My choice is the filter method. It is very simple once you have obtained the crystals or the mechanical filter. The initial adjustment is not difficult, a very simple v.t.v.m. (uncalibrated will do) and an oscillator such as a BC221 are all that are required for alignment of the filter. This alignment stays put for a very long period. My own crystal filter has only required attention once in the past three years and that was caused by a circuit modification.

The phasing method is very popular in Australia because audio phase shift networks are readily available. An oscilloscope is helpful in the adjustment of this type for best results, but do not worry if you do not own a scope, your receiver can tell you a lot about your alignment. The phase shift network is designed to work over a range of 360-500 cycles. Audio frequencies outside this range are not shifted in phase sufficiently, so care must be taken to restrict the audio response of the speech amplifier. It is my opinion that most of the stations that have poor sideband suppression have not taken enough care in this direction.

It does not matter which method is used, as long as a good s.b. signal is produced. Both methods are capable of this.

Q9: Why use 5 or 9 Mc. as the output frequency of the sideband exciter?

A: The s.s.b. signal must be generated at the required output frequency or heterodyned to that frequency. An 80 metre sideband signal for instance, cannot be multiplied to 40 or 20 metres, as we are so used to doing in an a.m.

* 22 Seiffert Centre, Queanbeyan, N.S.W.

or c.w. transmitter. With some filter-type exciters, the s.b. is generated at a low frequency around 450 kc. and then heterodyned to a high frequency. Recently high frequency crystal filters have been making an appearance. Phase shift type generators also fall into two categories, those that produce the signal at the output frequency and those that generate it at some i.f., say 9 Mc. The sideband transmitter that generates the signal at the output frequency has a couple of disadvantages. The r.f. phase shift circuit requires adjustment when large frequency changes are made within a band unless the operator is willing to tolerate a degraded signal. Band switching is complicated by the need to change the r.f. phasing circuit values from band to band.

When heterodyning the signal into the desired band, a careful choice of frequencies must be made. Let us take some actual frequencies and see what happens when our choice is the wrong one. Assume that we have an exciter with an output frequency of 7.1 Mc. To put this signal on 14.3 Mc., where most s.b. stations operate on 20 metres, we will require a mixing frequency of 7.2 Mc. Mixing these two signals will give us output on 14.3 Mc. rightly enough, BUT the second harmonic of our 7.2 Mc. oscillator will appear at 14.4 Mc. and if it gets into the grid of the subsequent amplifier, as it surely will, it will be amplified along with the 14.3 Mc. energy. The 14.3 Mc. tuned circuits will have insufficient selectivity to reject the 14.4 Mc. c.w. signal. Transmitting this c.w. signal at 14.4 Mc. is illegal but worse than that, it is using valuable power that should be going into the s.b. signal.

Now consider the exciter output frequency of 5.3 Mc. Mixing this signal with that from a 9 Mc. oscillator produces a sideband signal at 14.3 Mc. The second harmonic at 18 Mc. is far enough removed to cause no trouble. The difference frequency is also useful in this case as it falls on 3.7 Mc.

Before deciding on the output frequency of your exciter, put pencil to paper and work out where those harmonics will fall. There are traps set for young players in this aspect of getting a sideband signal on the air.

Q10: What type of linear amplifier should I use?

A: Many Amateurs have been worried by the thought of these amplifiers and are quite sure that they have had no experience with them, particularly in the r.f. field. Receivers and audio amplifiers are full of them, so they are not so strange after all.

In single sideband transmitters, the driver amplifiers are usually operated in Class A and sometimes in AB1. The final can be operated in Class AB1, AB2 or B. There are several points to consider in each case.

The big advantage of AB1 operation is that no power is needed to drive the tube, only voltage is required. This means that the driver does not need to be a large power tube. A 6AG7, 6CL6 or 12BY7 is suitable for this job. As grid current is not drawn in a Class AB1 amplifier, a simple bias supply can be used and by metering the grid circuit, overdrive can be seen as soon

as it occurs. The 6146 tube is admirably suited for this class of service. A new tube in the U.S. has been announced that should be nicely for the Australian Amateur, this is the 7270 and will run 150 watts comfortably.

When a tube is operated in AB2, grid current is drawn over portion of the cycle, so that a variable load is presented to the driver amplifier. This problem can be overcome by using a swamping resistor across the final grid tank circuit. More driving power is required to offset this swamping. The bias supply requires regulation and careful design. The distortion figures are greater than for AB1 but less than for Class B. The old favourite, the 807, works very well in this class.

Class B operation offers some advantages, especially when zero bias triodes are used. This gets away from bias requirements and screen voltage problems are eliminated. However, considerable driving power is required.

For absolute simplicity and good efficiency, the "ZL Linear," designed by ZL1AAX, is hard to beat. The amplifier devised by G2MA is very similar and does have the advantage that a lower value of bias will cut the tube off while receiving, if this is found necessary. Neither of these two amplifiers require a "stiff" grid bias or regulated screen supply.

In conclusion, some don'ts are in order. Don't tolerate any regeneration or instability in your s.b. transmitter. Don't overdrive any part of it. Don't turn up the audio gain in order to make the speech peaks read the same level on the final plate meter as that obtained with steady tone input. Speech peaks of about half the steady tone figure are adequate. Remember that the plate meter is far too slow to read speech peaks. If you have ever used a bug on c.w., you will know that the dots read about half the value on the plate meter as the dashes, but both are received at the same strength.

If you are interested in sideband, and who isn't these days, two books will be found very helpful. These are the A.R.R.L.'s "Single Side Band for the Radio Amateur," and "The New Sideband Handbook," by Don Slater, W6TNS. If you have any problems, join any of the sideband nets that are to be heard nightly on 40 metres—you will be very welcome. Let your problems be our problems.



YOUR MASTER SWITCH

Do the members of your family know how and where to turn off your rig? Do they know how to treat a person suffering from electric shock? Remember that death is permanent, and so for your safety you should instruct your family how to turn off your rig and you should also prominently display that page of the Call Book dealing with First Aid in Case of Electric Shock. Do not become an accident statistic, take care and enjoy your hobby.

A slightly dumb Amateur, Sam,
Just couldn't stay out of a jam,
A live rig he'd test
But the bleeders went west
And presto—barbecued Ham.

—Courtesy "CQ," Jan. 1960.

REPORTING—AS DISTINCT FROM QSL'ING

(Continued from Page 9)

tive report which I appreciate. Such reports are of great value when the transmitter is being adjusted . . ."

Our hard working QSL Manager knows how many reports I send out from here when the station is in full swing (which it has not been for almost a year), and I am sure that he would agree that it is well worth it when you get a reply such as this from one of our very busy DX men.

I was always of the opinion that comparative reports were of value, but have learned that this is not always the case. If station A is operating under exactly the same conditions as station B (that is, with the same power, similar antennae, etc.), then a comparison will be interesting, but very rarely does this situation exist. A very simple example of this can be taken from my 80 metre log. There are several stations operating in Albany, which is just 35 miles from here. In the main, their transmitters and antennae are entirely different, and consequently their signals vary from one another. Now if these stations are overseas DX, their signals would vary just the same, and yet a comparative report to any of these chaps would be of little benefit as their rigs are so different. However, comparative reports are of interest when dealing with v.h.f. signals.

Endeavour to pin point your locality (QTH). There is little point in telling the overseas station that your QTH is Woormargama, for one thing he has never heard of it, and another is that he will not find it on any map, which he is likely to have. But tell him you live in a small town some 350 miles S.S.W. of Sydney and he will know at once from where the report has emanated. The ideal system of course is the outline of either your State or even the coastline of Australia printed on your card with your locality pin pointed, similar to that used in a very well known line of American QSL cards.

Many thanks to Maurice Cox for his assistance in preparation of this article, which is intended mainly for the many newcomers to short wave listening, and I ask for forbearance from those old stagers for all this may seem ancient history. Remember, however, that the old started once and a little guidance in the early stages would have helped us no end.

To any newcomers who have any queries on this subject, I would like to have you contact us. In VK2 a note to Barney Smythe, W1A-L2001, or in VK3 to Maurice Cox, will bring you the information required in a very short time. Both addresses are in the W.I.A. Call Book, obtainable from your Division at 6/- per copy. Any queries on the subject of broadcast reporting and allied subjects can be obtained from Gerry Albeck, W1A-L2011.

—D. Grantley, W1A-L2023



T.V. PERMITS GRANTED

VK—
XDR/T—S. Hancock, 15 Tedman Pde., Sylvania.
2VO/T—V. Molesworth, 87 Jersey Rd., Wool-
shra.
2AIG/T—F. A. Freeman, 10 Riverdale Rd.,
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Model 6a 3/32" (Push-on)	6	6	0.25 oz.	6"	As for Model 6 (for extremely delicate work only).
Model 9 5/32" (Push-on)	6, 12, 24-27½	8.3	0.25 oz.	6"	Hearing Aids, Radio and TV Sub-assemblies, Coils, Electronic Instruments, Model Construction, Electro-Medical, etc.
Model 12 3/16" (Push-on)	6, 12, 24-27½	12	0.5 oz.	6.25"	Radio, Television, and Telecommunications assemblies.
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MS P2.58

FEEDBACK

Today we read of the various disruptive elements within our society, and Amateur Radio is no exception. During the past months it has been most noticeable that the Sunday WI broadcasts have been made with a heterodyne beat from an unknown station or stations. It is very difficult to establish if Amateurs are to blame or if this interference is due to sources outside the Amateur Service, but if Australian Amateurs are causing this interference then they can be classed with every other form of noncommunity service, and should be expelled from the Amateur ranks.

Not everyone listens to the WI broadcasts, but these Sunday sessions are a valuable means of telling people what is happening and are part of the Amateur communication network. Therefore it is every Amateur's duty to ensure that the official WI Sunday broadcasts are made on a channel free from interference and this includes driving a v.f.o. at full power across the band. Keep the Sunday WI official broadcasts free of interference.

The co-editors are to be congratulated upon adding a new column in "A.R.", namely a.s.b. This was long overdue and in conjunction with the DX, S.W.I. V.H.F. and Divisional Notes provides a balanced report of Amateur activities, but there is one exception.

No doubt the co-editors would have noticed this exception if they were not so busy editing, or whatever they do. (Noticed that they published a par which stated that the "Geloso" receiver was made by the "Heath" Co. Apparently they do not read every article). The exception is—Federal Executive reports. It is granted that F.E. are too busy, are overworked, and have just not the time available to furnish a regular monthly report, but who in the xcvf has as this column is written in time that is not available. So it is suggested that an "A.R." now presents a balanced (1) account of Amateur activities. F.E. should maintain that balance by reporting to the readers each month. No doubt the co-editors could make space available, as they are appealing for articles. Oh well, maybe this will be the last issue of this column as only the good are censored early and have pansies at their service.

Suggest that a well known supplier learns that an "A" after a serial number denotes a change. This would help many when assembling the unit, because now the thing won't work according to dial.

Progress — Publicity — Public Relations.

The Australian Call Book is strange title for a W.I.A. publication methinks.

Have you ever heard of Snow in Fiji? I have.

[Lucky we don't read every article or this would not be published.—Editors.]

TRADE REVIEW

R.C.A. VOLT-OHM-MILLIAMMETER

Amalgamated Wireless (A'sia) Ltd. have announced details of the new R.C.A. 38A multimeter kit which is shown in the accompanying illustration. The kit features low weight (3½ lbs.), compactness, printed circuits, sensitivity, wide range and a space for housing the test probes which are supplied.

The d.c. volt ranges cover from ½v. to 5kv. full scale at 20K ohms/volt, and the inclusion of the two low voltage ranges will assist when working upon transistor circuits. The current ranges cover from 50 µA. to 10 amps., and the ohm ranges measure to 20 megohms at 7½ volts.

A.C. volts at 5K ohms/volt cover from 2.5v. to 5kv., and separate ranges cover a.f. volts to 250v., and decibels to +50 db. The A.C. ranges have a flat (±½, db.) response from 10 c/s. to 50 kc/s., so are useful for hi-fi work.



The accuracy is within accepted commercial tolerances, namely: ± 3% d.c., ± 5% a.c., ± 3% mid scale ohms ranges, ± 3% d.c. current, and ± 5% a.f. volts.

The unit is housed in an attractive bakelite case (with recessed lettering so that it will not rub off in use), the dimensions are 5½" x 8" x 3", and the meter movement (50 µA.) is encased in a clear plastic which permits easy reading of the five dial scales.

The unit would be a very useful adjunct to any service bench or well equipped Amateur shack. Further details are available from A.W.A. Ltd., 47 York St., Sydney, or Queen St., Melbourne, who can also supply a completely wired and tested unit for those who do not wish to assemble their own kits. Prices: ex Sydney, factory built meter, £24/10/0 plus tax; kit of parts, £18 plus tax.

COPY DATE—8th

Correspondents are reminded that copy for this journal must be in our hands by the 8th of the month. This does not mean that you post it on that date; it must be in our box by then, or better still, prior to that date.

BOOK REVIEW

"89 SIGNALS"

Written by William Orr, W6SAI/3A2AF

This inexpensive publication will assist the a.v.l. and Transmuting Amateur to get the greatest benefit from a series of antennae which cost little and perform well. The booklet is well written and liberally sprinkled with illustrations. It is recommended as a useful addition to the library of any Amateur.

Our copy from: McGill's Authorised Newsagency, 153-163 Elizabeth St., Melbourne, C.I. Price 1/6, Postage 8d.

RADIO HAMS AMONG R.A.A.F. MEN IN MALAYA

Several members of the R.A.A.F. serving at Butterworth in Malaya devote hours of their spare time to Amateur Radio.

A future pilot, Flying Officer Ron Johnson, who formerly served with No. 1 Squadron in Malaya in 1964 as a signaller, now works his station FM2GS from his home on Penang. Flying Officer Johnson, who comes from Bondi, N.S.W., serves with No. 3 Squadron.

Another Amateur, Flight Lieutenant Keith Avery, of Brisbane, Qld., has held a license for 21 years. He has been working his radio on Penang Island and in the space of three weeks worked 100 countries, thus qualifying for membership in the "Century" Club. He said, "This is surprising because the area we work from has one of the highest noise backgrounds in the world."

Another Amateur at Butterworth is Corporal Ray Pulford, of Greensborough, Vic. Corporal Pulford has been working his radio since Dec. '56, having been an Amateur for more than eight years.

R.D. CONTEST

Is your equipment ready for the most popular Contest of the year? Remember the date, 13th and 14th August, '60. For scoring purposes only, VK5 and VK8 are combined as one call area this year. See you in the Contest?

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The improved version of the ARS5 and ARS5A Exciters is now available. Although the circuit remains almost unchanged, the unit now comes to you in an all-steel cabinet with an additional tuning control in the mixer circuit of the ARS5A unit, thus permitting a choice of both Low and High ⁽²⁾ outputs.

ARS5 comprises the following: 12AT7 audio, 12AU7 driver to "Aswel" audio p.a.n., 12AU7 xtal oscillator, 12AT7 audio amp., 2 x 6AL5 diode B/Modulators, 6BA6 Class A output stage.

ARS5A: Similar to above except that a 6BE6 mixer stage is included in place of the 6BA6 linear, switchband 80-10 mhz.

Both units feature Selectable Sidebands and P.M. positions.
Price: ARS5, £26/10/0; ARS5A, £28/10/0 (both less valves).
Quotes gladly given on any custom-built equipment, be it S.S.B., A.M., or associated equipment.

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7 Mc. Mobile Meeting at Bringelly

CORRESPONDENCE

A meeting of some of the 7 Mc. mobile VK2 gang was held near Bringelly on Sunday, 14th June. Perfect weather was turned on and the spot chosen for the meeting seemed to meet with general approval.

After several mobile/"base" and mobile/mobile QSOs, 11 cars with waving whips assembled, together with three cars not yet fitted up (but with intentions). Altogether 17 Hams, with

their XYLs and harmonics, were present; about 50 persons.

The usual greetings over, everyone got busy on the barbecue, rig inspections, note swapping, etc.

Hams present were: VKs 2ALR/M, 2SW/M, 2SG/M, 2WJ/M, 2CR/M, 2CK/M, 2HR/M, 2CE/M, 2SV/M, 2VL/M, 2ADA/M, 2ACV, 2APQ, 2ZO, 2AAC, 2ACW, 2PK.



Group of Amateurs at the 7 Mc. Mobile Field Day at Bringelly on 12/6/60.

Back Row (left to right): VKs 2SV, 2APQ, 2ALR, John, 2AC, 2HR, 2CE.

Front Row (left to right): VKs 2ACV, 2CK, 2VL, 2SG, 2CR, Dick, 2SW, ROR.

Photo by John 2WJ.

HOW TO WIN THE S.W.L. RD. CONTEST

Contest season is upon us again, and Peter Carter's letter in the s.w.l. page of June "A.R." prompts me to forward a few comments which may help the newcomer in the Contest field to match his wits against the old few whose names appear regularly in the result list of this very popular event.

"I wouldn't know where to start" is a popular answer to a request for a new member to enter the R.D. Contest, and it is obvious from correspondence received here in my capacity as Amateur Advisor to the VKS S.W.L. Group that many would-be entrants just haven't a clue what it's all about.

The Contest is in memory of the Amateurs who gave their lives in the last War, and the idea is for as many licensed Amateurs in a given State to contact their counterparts in other States. The stations exchange a serial number, consisting of five figures in the case of phone operation, and six in the case of c.w. The serial number consists of the signal report, plus three figures which increase by one for each contact. Our task as listeners is to act as many transmissions, including station calling, station heard, and number sent, but we cannot log or claim points for transmissions within our own State. We can, however, claim points for a station answering one within our State.

Full scoring is given in June "A.R." together with rules of the event. These are easily followed, but if the would-be contestant is in any doubt, he should contact one of the contest regulars in his State, who will put him on the right track. If you are able to enter do so, even if you log only a dozen calls. It is not hard to do and your action will be appreciated by those who are striving to keep the S.W.L. Groups moving along.

But maybe there is a newcomer somewhere who will try and win the event. Here are a few pointers from this operator, who has had some success in the event of late. Firstly, if you want to win, your equipment must cover all the h.f. bands, and if possible the two major v.h.f. bands, for bonus points are available to entrants on these frequencies. Time is of paramount importance. It is advisable to log for as long a period as possible—the entire 24 hours if possible. Secondly, forget those soft pencils, get two or three 5/16s, these are handy and sharpened to a fine point prior to the event, they will see the 24 hours out without wasted time in sharpening. Ball point pens are not ideal things for logging over long periods; this I discovered in the '57 event.

The W.I.A. standard log sheet, which is available for contests, is the best log available: paper is suitable for a hard pencil, and they are ruled to suit the rx section as well as the other. To save time in ascertaining if a station has been logged before, it is advisable to have a record of some sort. An old call book can be used, marking a station with a distinctive mark for each band, but I prefer to have several sheets of foolscap lined, and ruled into five columns, one for each band, and one sheet for each call area. Upon logging of a station, his call can be entered on the sheet, and as the event progresses you can tell at a glance if that station has been logged on that band before.

Listen carefully to each contact. If you mist the serial number when sent, chances are that the station on the other end has done likewise and will ask for a repeat, or maybe he will repeat it and ask for verification. Thus you have another chance at logging the number.

In the small hours when activity slackens on 40 and 80 mc, it is possible to run a rx on each of these bands with a single earpiece connected to each set, and mounted on a single headband enabling you to monitor both bands with little trouble. Earphones are preferable for contest listening as they keep most distractions out of earshot.

The event is not easy to win, but with careful operating, and attention to small details, any reasonable operator has a chance. I find it unwise to lose a single point in hopes of logging a station who will give a higher score, for you will doubtless score him later on. In other words, take everything that comes your way and keep your nose down to it. Then you may have a chance of defeating our Mr. de Balfour of VKI whose reputation in the R.D. is slanted as great as BESS-125 when there is a new country about.

—Don Granley, L3089.

★

INTERMEDIATE FREQUENCIES OF SOME DISPOSALS RECEIVERS

1132, 1132A	12 Mc., 75 Kc.
1135	50 Kc.
1124A	7 Mc.
RA10D	1630 Kc.
MN26C	112 Kc.

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

CEASATION NOT DUE TO APATHY

Editor "A.R." Dear Sir,
I note with interest your reference to pre-war (1939) v.h.f. activity in the current issue of "Amateur Radio".

I regret deeply since those days the necessity for my cessation in participation of Amateur Radio.

The reason is not in any way due to apathy but because of my being unable to overcome the insurmountable illness which has beset me since 1944.

However, the pages of "Amateur Radio" bring me much pleasure each month, and I take this opportunity of wishing the Institute every prosperity in what looks like a battle for frequencies in the near future. Please excuse my shaky handwriting. It is difficult to write and the typewriter has become a formidable obstacle.

—Don B. Knook.

FIELD DAYS

Editor "A.R." Dear Sir,
There have been comments by the Institute on various occasions that the Field Days are not very well patronised. It is most noticeable however, that the publicity given to this Contest—both before and after the single operation, which call sign was used. In many cases, the stations are set up by a number of Amateurs, the winner receives a mention in the listing.

During the last Field Day, our club organised a station, and although it was carefully mentioned on each log sheet, no reference was made to it in the results.

Surely a mention of the group concerned would not be out of place, even though the certificate of appreciation by club? Members of our club were all disappointed at the club (or any other for that matter) not receiving a mention, and feel that more publicity would encourage more clubs and groups to participate even though a club call was not obtained.

Field Days are good fun, and hard work—so let's have publicity in the magazine equal to the occasion!

—R. A. Catmur, VKFFY, Hon. Sec., Elizabeth Amateur Radio Club.

EQUIPMENT STOLEN

Editor "A.R." Dear Sir,
On 25th May last the radio room, built in at the rear of my home at 93 Yarrab Ave., Balwyn, E.S. Vic., was burgled, and at the same time my equipment was stolen. In informing you of the details with the request that it be published in "Amateur Radio". The Police have suggested that the publicity given to the matter the better the chance at the same time, I feel that a warning could well be passed on to other Hams.

My home was very thoroughly locked, but the thieves somehow managed to choose an occasion (between the hours of 5 p.m. and 11 p.m.) when everybody was out, and entered the house by the back door. They went straight around the back to the shack, showing no interest whatsoever in any other part of the house. Only certain selected items of receiving equipment were stolen; while it seems clear that the burglar had a knowledge of and interest in radio receiving and/or service work, he completed the theft of all the equipment. For this and other reasons, I do not believe that any member of the Ham fraternity was involved.

The equipment stolen included one BC346Q receiver with separate plug-in loudspeaker; one home-made "Monitarch"; "Magnecouder", professional-type tape recorder; one "scope" cathode ray oscilloscope, one "Heathkit" vacuum tube voltmeter, one "Sanwa" multi-meter, one F.M. 2-st. tele. hand-set, one U.S. disposals origin; one Bendix frequency meter, less case but with separate home-made power supply; and one "Fruite" soldering gun. In view of your readership, I feel that it could be in the above list, are requested to contact the C.I.R. at the Camberwell, Vic., Police Station, or mail to the address at—

—Alan E. Reid, VK3AHR.

AMATEUR CALL SIGNS

AMENDMENTS FOR APRIL '60

NEW CALL SIGNS

VK—
1ZDG—D. R. Gotthard, 5 McDonnell St., Yarralumla.
2BS—J. W. Sluiter, 397a Housing Settlement, Bredford Park.
2CA—R. M. Harrett, O.T.C. Receiving Station (Radio), Bringley.
2RG—J. M. Jones, 328 Carrington Ave., Hurstville.
2AFW—G. H. Martin, 101 Birrell St., Waverley.
2AFH—W. C. H. Haynes, 54 Mt. Lewis Ave., Punchbowl.
2ZDM—J. Dyer, 43 Cardigan St., Guildford.
2ZKA—K. W. Andrews, 1 Clarence St., Burwood.
2ZMM—M. M. Stewart, 10 Alice St., Jannell.
2ZOH—O. L. Holmwood, 47 Boronia Ave., Chesham.
2ZRP—R. Parton, 16 Renown Ave., Oakley.
Victoria
3FX—P. Furr, 106 Korolt St., Warrnambool.
3AAO—J. B. O'Hara, 3 Lynden Gr., Mt. Waverley.
3AFW—P. R. Williams, 82 Watlie Valley Rd., Canterbury.
3ASG—L. W. Brown, 19 Emerald St., Preston.
3ZHI—R. L. Moncur, 235 Union Rd., Ascot Vale.
3ZHN—A. C. Martin, 104 Thames St., Box Hill.
3ZHO—M. D. Kennedy, 58 Weddell St., Shepparton.
3ZHP—W. F. Moroney, 28 Smith St., West Brunswick.
3ZJG—G. J. Merrill, 11 Roberts Court, Moorabbin.
3ZJF—P. R. Gilbert, 78 Broadway, Bon Beach.
Queensland
4LE—L. W. Hoobin, Sunset Boulevards, Surfers Paradise.
4BQ—S. B. Silver, O.T.C. Radio Station, Thursday Island.
South Australia
3CN—R. A. Beavis, 30 Pultford Rd., Prospect.
3EL—D. R. Cullen, Station 142 Ward St., Mth. Adelaide; Postal: Bag 11, Victor Harbour.
3EV—J. J. Mount, 7 Donnington Rd., Elizabeth North.
3EY—A. A. Cotton, 22 Garland Ave., Kilburn.
3PF—C. M. Pearson, 333 Main North Rd., Elizabeth North.
5ZCL—P. T. Latham, 30 Langford Ter., Salisbury North.
5ZDM—I. N. Cousins, 3 Wootona Ter., St. George's.
5ZDU—A. G. D. Landers, 78 Grant Ave., Rose Park.
Western Australia
8FG—F. G. Gilch, Milng.
8E—R. R. Ekin, 112 Beach St., Fremantle.
6ZCK—M. N. Hughes, 314 Churchhill Ave., Subiaco.
6ZCU—E. Hanham, 4 Frederick St., Albany.
Tasmania
7ZAX—P. L. Corby, 44 Congress St., South Hobart.
Territory of Papua and New Guinea
6GR—Goroka Radio Club, C/o Secretary, P.O., Goroka.
Antarctica
0DM—D. V. Monk, Mawson.
0ID—I. K. Douglas, Davis.
0NB—N. R. Barratt, Davis.
0RL—R. G. Levick, Macquarie Island.
CHANGES OF ADDRESS
VK—
2SV—S. H. Weston, 18 Park Ave., Roseville.
2XG—J. M. Retailick, "Do Me," Pacific Highway, Urunga.
3YA—R. C. Black, 21 Bardwell Rd., Bardwell Park.
2AKW—G. Humphrey, 37 Stanley St., Bl. Yves.
2ANN—D. W. Morris, Lot 32, Fuller St., Colaroy Plateau.
2AUG—R. B. Gills, 115 Donald St., Hurstville.
2ZAQ—L. W. Cook, 22 Leitchhardt St., Seven Hills.
2ZGS—J. J. Sullivan, Flat 1, 14 Palmerston Ave., Waverley.
Victoria
3US—G. M. Chilver (Mrs.), 20 Smith St., Leon-ga.
3UW—R. B. Wallace, 17 Gilbert St., Wodonga.
3VL—R. M. Churchward, Station 1 Quinn St., Numurkah, Postal: P.O. Box 73, Numurkah.
3VR—J. H. Dexter, 34 Mt. View Ave., Parkdale.
3VY—D. G. Wallace, Mill St., Bendigo.
3ADI—D. G. Turner, 36 Taurus St., North Balwyn.

3AKF—K. J. Lloyd, 49 Bennett St., Forest Hill.
3AMN/T—I. D. McNabb, 11 Paton Rd., Boronia.
3ZES—H. J. Simmona, 37 Melville St., Numurkah.
3ZJA—E. C. Ascherl, 206 Waterdale Rd., Ivanhoe.
3ZJS—D. A. Stewart, 43 Tennyson St., Elwood.
Queensland
4EL—E. J. Lake, 17 Stanton St., Belgian Garden, Yeppoon.
4HC—R. E. Clem, 7 Molloy St., Silkstone, Ipswich.
4ZAZ—J. L. Bickford, 22 Mansfield St., Rockhampton.
4ZBJ—J. M. Burton, 19 Herbarion Rd., Atherton.

4ZCK—R. W. J. Hazell, 11 Vale St., Red Hill, Brisbane.
4ZCL—C. C. Burns, Flat 2, 224 Murray St., Rockhampton.
South Australia
5TS—Metro Radio Club, 95 Henley Beach Rd., Mile End.
Northern Territory
5PL—J. G. Porter, Station 1 Blake St., Darwin; Postal: Group Engineer, P.M.G. Dept., Darwin.
Western Australia
6FA—R. F. Ager, 36 Wynyard Way, Thornlie.
 (Continued on Page 17)

THE PUBLIC SERVICE OF PAPUA AND NEW GUINEA

RADIO TECHNICIANS Senior Radio Technician (several positions)

£1,584-£1,660 p.a. (single)
£1,734-£1,810 p.a. (married)
 (actual rates)

Qualifications: Qualified as P.M.G. Senior Technician (Radio) or equivalent.
Duties: In charge transmitting and receiving stations; V.H.F., M.F./H.F., C.W. and radio-telephone trunk and out-station services.

Radio Technician (several positions)

£1,354-£1,495 p.a. (single)
£1,504-£1,635 p.a. (married)
 (actual rates)

Qualifications: Qualified as P.M.G. Technician (Radio) or equivalent.
Duties: Assist in maintenance and installation communications, transmitters and receivers V.H.F., M.F./H.F.

Appointments: Permanent or fixed term appointments. Officers of Commonwealth Public Service will be considered for transfer pursuant to Section 43 of Public Service Act for period of up to two years in first instance.

Accommodation: Single quarters available; married accommodation unlikely to be available under 18 months from date of appointment.

Separation Allowance: Payable at discretion of Territory Administration; designed to compensate for added expense of married appointees obliged to maintain family outside Territory.

Child Allowance: For first dependent child under 16 years — £52 p.a. For subsequent dependent children under 16 years — £65 p.a. All officers receiving adult male rates of salary are required to contribute £26 p.a. towards cost of allowance.

Leave: Three months after each 21 months in Territory and 6 months' furlough after 20 years. If permanent, additional 3 months' leave after each 6 years.

Further information: An information handbook on the Territory and its Public Service is available from Department of Territories, Canberra or Sydney, or from any Commonwealth Public Service Inspector, Commonwealth Employment Office or official country Post Office. Other enquiries to Department of Territories, Canberra (phone 7-0411, ext. 29A).

APPLICATIONS

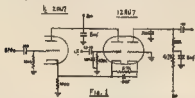
SUBMIT on prescribed form available from above offices —
TO — The Secretary, Department of Territories, Canberra.

SIDEBOARD

Bud Pounsett, VK2AQJ
22 Seifert Centre,
Queanbeyan, N.S.W.

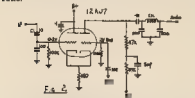
PRODUCT DETECTORS

The product detector has been gaining favour among Amateurs interested in obtaining better reception of s.b. signals and incidentally, c.w. A properly adjusted product detector makes for a cleaner signal in the output of the receiver and less manipulation of the gain controls, but it is not the end-all to sideband reception. Many Amateurs have been led to believe that this detector makes some magical difference to a receiver enabling them to tune a.b. signals with the greatest of ease. Even though it does effect considerable improvement in the receiver, it does not remedy sloppy tuning mechanisms or make up for lack of bandwidth.



Here are a number of product detector circuits which will give good results. There is a wide difference of opinion on just which is the best. The circuit of Fig. 1 was first described by Murray Crosby, W6CXY in "QST," May 1956, and analyzed rather fully by Dan Hesley, W1HIC, in "QST," Dec. 1957. Both these articles were reprinted in the second edition of "Single Sideband for the Radio Amateur". For optimum results, use 2 volts r.m.s. input from the b.f.o. and a maximum of 0.8 volt r.m.s. from the i.f. channel. Although this circuit requires two tube sockets, it does not require a complex filter in the output to eliminate the b.f.o. feed-through. At the lower intermediate frequencies this is a problem with some product detectors causing overloading of the first audio amplifier.

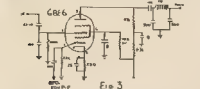
Fig. 2 shows a product detector that has been used by many Amateurs—largely without success. This has been brought about by failure to attend to proper input levels at both grids and to provide for the attenuation of b.f.o. feed-through. The filter in the output of the detector can be used to accomplish two important functions. It will eliminate the b.f.o. signal and, with a cut-off frequency of 3 kc, can shape the audio response of the receiver, giving an increase in the overall signal-to-noise ratio.



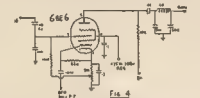
Receiver converter tubes can be used very successfully. Fig. 3 shows a simple application of the 6BE6 tube. This circuit needs little explanation as it follows normal frequency conversion techniques. However, the circuit of Fig. 4 is a little different. This allows for the effect of intermodulation distortion and was published by Ekstrom, W2UGX/3, in the May 1959 issue of "QST". He advises that adjustment of the circuit can be made with the aid of an oscilloscope and two audio signals at about 5 kc and held a volt in magnitude. The two signals, differing by 500 c.p.s., are applied to the signal grid and the 500 ohm potentiometer is adjusted for minimum difference frequency component (580 c.p.s.). A low pass filter is recommended at low intermediate frequencies.

Owners of the popular Q6er, BC453, receiver will be interested in the product detector (Fig.

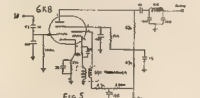
5) used by VK8ST. Norm reports that this circuit is very successful. The 12CX or 6G5 tube can be used depending on the other tubes that are in your receiver. Again attention of the b.f.o. signal must be obtained for optimum results.



In order to arrive at the proper input level from the i.f. channel the following procedure may be found helpful. Tune to a strong station, a h.c. station is a good choice, and try various values of C1, so that there is no output from the receiver with the b.f.o. switched off. Any output under these conditions means that the detector is being overloaded and results in high distortion even when the b.f.o. is switched on again. Of course, a v.i.v.m. with an x.f. probe is the best tool for this job but remember that when measuring the i.f. channel output at the signal grid do so with a very strong signal and the r.f. gain at maximum.



Here's wishing you better sideband reception and if you wish to try out your own meter radio telephone will surely put you in touch with a sidebander who will be pleased to help.



GENERAL

New York City is the headquarters of the S.S.B. Amateur Radio Association but this does not prevent any interested VK Amateur from joining. The Association publishes a monthly journal which is packed with sideband doings, DX news and technical information. The annual subscription is \$3 (U.S.). Interested Amateurs may write to VK2AQJ for additional gear, plus a sample copy of "The Sidebander" and a membership blank. You can write direct to the S.S.B. A.R.A., 13 Elm St., Lynbrook, N.Y., U.S.A. The S.S.B. A.R.A. is an organisation dedicated to furthering s.b.b.

Glenbrook, in the Blue Mountains (VK3) has quite an Amateur population and one of the outstanding signals is that from 2Q2AU, ex-JU0, a c.w. operator of many years' experience, has found that his phasing rig on 40 metres has added much enjoyment to his Amateur activities. Voice control operation really aids him on the excellence of a.s. transmission. Col's generates the sideband on 8.8 Mc. The v.f.o. covers 5.45 to 5.6 Mc. and this is combined with a 3.6 Mc. xtal oscillator to produce 1.85 to 1.9 Mc. which, mixed with 8.8 Mc., results in output in the 40 metre band. The v.f.o. stability is very good and seems to be one way of dodging the troubles caused by tripping the v.f.o. to 10 or 20 Col is very active and if you are interested in his method of attaining frequency stability be sure to call him when you hear him and that 803 in the final makes sure that you will.

If you require plenty of capacity to maintain good plate supply regulation a simple way out is to follow VK3K's example by purchasing several 120 v. 45W. type E83AF capacitors that are now available. The idea is to arrange

them in series-parallel until you have the desired capacity and voltage rating. Remember to place a margin voltage divider across the capacitors. Jim has his connected to give 60 v. at 2,000 volts in a space 9 x 9 x 5 1/2 inches. This can be used in the receiver why these 81LAS produce such a quality signal, easily one of the best on the bands.

It is pleasing to hear a couple of Amateurs of long-standing leaving their carriers behind. Percy VK2OZ and Tina VK3TW have both been using s.b.b. and have excellent signals. These are in the balance modulators 3CH, while 6146s perform very well from Hamilton. My guess is that a.s.b. will be heard from both these stations before very long.

May I offer my thanks to all of you who have sent me information, either by mail or over the air. Also to those who have shown interest and to the suggestions, VK3U, for the support and our sideband notes will continue to grow. Watch out next month for a c.w. monitor that you can build into your linear amplifier.

MAGAZINE EXTRACTS

"Short Wave Magazine," May '60
P1 Section Interstage Coupling—P1 section networks in 1x stage before the p.s. A discussion with circuit showing how high interstage efficiency and harmonic attenuation may be achieved. Discussion centres around 6AG7 and 6BG6 tubes in the exciter

Making Widespread Couplers—Design and constructional data
"CQ," June '60
Improvements on the Selectafect—In this slightly improved form, the S.O.J. offers choice of adjustable "rural" amplification, single frequency rejection, or tunable single frequency excitation.
Better V.F.O. Stability—485 odd p.p. across 3 turns on half inch diam. former. This high C. Colpitts oscillator is extremely stable. The circuit making it change frequency is the tuning dial.

RE-ECHO FROM MACQUARIE

The following is an extract from "Short Wave Magazine," June 1955—
On 24 Dec. 54, in the March issue, we mentioned that the first radio station in Antarctic regions—though not, strictly speaking, within the Antarctic circle—was established on Macquarie Island by sound by Peter Douglas, VK2AC, as far back as 1911. The interesting thing is that we hear (from VK3NO) that one of Mawson's original operators, Walter Hannan, is VK3ACH, still going strong at the age of 74, and happily active on 30, 40 and 80 metre phone bands. What a magnificent record. The KC4 boys of today have nothing on this, though Byrd did start in the Antarctic in 1929, with Amateur Radio as his sole link with the outside world."

AMATEUR CALL SIGNS

(Continued from Page 18)

- 6KS/T-T. Storer, 13 St. Michael's Ter, Mt. Pleasant
- 2ZAS-S. J. Stewart, 95 Railway Pde, Mt. Lawley
- 6ZBB-S. Brewer, 61 Golf View St. Mt. Yokine
- 6ZCE-K. Kosina, Flat 5, Block 130, Terrace Drive, Perth.

TELEGRAMS

- 7JP-L. J. Durkin, 14 Pleasant St. Burnie.

CANCELLED CALL SIGNS

- VK- J. McBrine
- 2BM-H. F. Trehanre
- 2AIX-R. M. Harrett (now VK3CA)
- 2AKT-Barnworth Radio & Electronics Club.
- 2PZ-R. E. Jones (now VK3R)
- 3ZAF-P. Furr (now VK3FX)
- 3ZDW-F. R. Williams (now VK3APW)
- 4SY-J. J. McGarry
- 4XY-L. J. McGarry
- 5SK-S. S. St. George
- 7JP-L. J. Durkin
- 6AS-S. S. St. George
- 6AW-A. W. Swart
- 6CC-C. J. Cooke (now VK3CC)
- 6EM-L. J. McGarry
- 6KM-E. J. MacKinnon
- 6HA-H. W. Alderice
- 7JV-J. Denholm
- 7OMC-C. J. Cooke
- 6RD-R. L. Harvey
- 6RT-R. M. Torckler
- 6TY-J. J. McGarry
- 6VH-F. A. Van Hulsdon

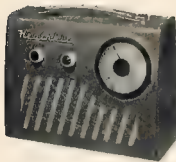


The **WARBURTON FRANKI** Page

SAVE with **HEATHKITS**

**Electronic Equipment
for HALF the cost**

So easy to build, thanks to the
step-by-step Heathkit procedure
booklet supplied with each kit.



BUILD YOUR OWN TRANSISTOR PORTABLE IN FIVE HOURS

HEATHKIT MODEL UXR-1

6 Transistors; Dual Wave Portable Radio

Superbly styled in a beautiful solid leather case with large, easy-to-read dial, the model UXR-1 is acknowledged to be one of the most attractive portable radios ever designed.

Printed circuit board makes construction simple and quick. Illustrated Heathkit "Step-by-Step" procedure enables even a beginner to do a first-class job. Large pictorial and detailed instructions in simple language show clearly just where every part goes. This is a powerful set with exceptionally clear reception. Small (only 8 1/4" long x 7 1/4" high x 2 1/4" deep), light and completely self-contained. Features six top-quality transistors, high-Q Ferrite rod built-in aerial, 7" x 4" high flux elliptical speaker.

Price: £27 plus 25% S.T

HEATHKIT O-12

5-inch OSCILLOSCOPE

VERTICAL CHANNEL

Sensitivity: 0.025 volts (r.m.s.) per inch at 1 kc.
Frequency Response: Flat within plus or minus 1 db from 0 c.p.s. to 3.5 Mc. Flat plus 1.5 to minus 5 db from 3 c.p.s. to 5 Mc. Response at 3.58 Mc., minus 2.5 db. (All response measurements referred to 1 kc.)
Rise time: 0.08 microseconds or less.
Overshoot: 10% or less.

HORIZONTAL CHANNEL

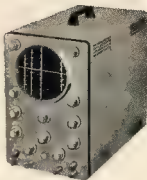
Sensitivity: 0.5 volts (r.m.s.) per inch at 1 kc.
Frequency Response: Flat within plus or minus 1 db. 1 c.p.s. to 200 kc. Flat within plus or minus 3 db. 1 c.p.s. to 400 kc.

Attenuator Low impedance type in cathode follower output

Input Characteristic: Selector switch permits use of external input through panel terminal, line-frequency sweep of variable phase or internal sweep from sweep generator.

Horizontal Positioning: D.C. type; permits wide range of positioning to examine any part of trace even with full horizontal gain.

Price: £62/10/0 plus 12 1/2% S.T.



HEATHKIT V-7A

World's Largest Selling V.T.V.M. KIT

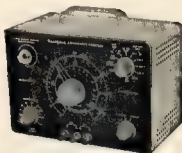
Specifications D.C. Volts: 7 ranges 0-1.5 to 0-1,500. Input Resistance 11 megohms. Sensitivity: 7,333.333 ohms per volt on 1.5v range. Accuracy plus or minus 3% full scale.

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Frank P. O'Dwyer, VK3OF
190 Thomas Street,
Hampton, Vic.

FIFTY MEGACYCLES

Life is not too easy for those who live for DX, there is very little of it whether it be F2 or E_s. The few breaks which did occur on E_s rewarded VK4/3 with one opening and VK3/4 with a couple over succeeding week-ends, some solace for those who have been waiting around. Those not waiting are mostly re-building equipment or redesigning beams in preparation for construction and erection when winter fades away to the north once again.

Though these fellows are busy in their own way, there is one group (though maybe they do not themselves work the spades) concentrating much thought and discussion for the good of the v.h.f.s in their spare time, and probably all the users of the v.h.f.s in the various Divisions put together. This body is the F.C.C. Some three months ago it started its work for the F.C.C. Rules Committee, and they are still at it. A provisional set of rules have been evolved and forwarded to Divisional Committees for comment by the various V.H.F. Groups and individuals. It is hoped that the lack of or lack of time, cannot participate in V.H.F. Group activity. These latter should comment through their own Division if possible and it is desired that all comments reach F.C.C. by April 1st.

New ground has been broken and a compromise reached in relation to the use of 80 mcs. for DX contacts and intrastate contacts on other bands. These suggested rules are possibly better than any used yet for the Contest and should suit all participants except possibly the diehards who are willing to give nothing away.

Salient points which differ from last year's rules are: (1) Sections, (2) Table 90 Mc. date, (b) Trans. 14 Mc. and higher, phone; (c) Recount all bands; (3) Suggest. phone; (4) Dec. to Dec. 31, 1960, alternatively from Dec. 17, 1960, to Jan. 17, 1961, or Jan. 1, 1961, to Jan. 31, 1961. (5) Scoring Tables, for 90 Mc., as last year; for 144 Mc. and higher (in numerical sequence read points for Intrastate, then Interstate contacts): 14 Mc. 1, 2; 240 Mc. 2, 4; 576 Mc. 4, 8; each higher freq. band, 10, 20 points. The following comments are by F.C.C.

Sections.—The 50 Mc. band has been given a separate section on account of the great difference between this band and the higher frequency bands. Likewise a different scoring table is proposed for the two sections. Separate Awards will be given for the two sections but the Trophy winner will be determined by the total score obtained in both sections. C.W. has been eliminated regrettably in deference to the limitation on Z call licenses.

Rate.—Three alternative dates are submitted for consideration by Divisions. Each is of one month duration. One is all Dec., another is all Jan., and the third is approx. half each month but includes five week-ends and the main holiday period.

Remember, these are NOT the rules. They are suggestions. The deadline for F.C.C. is Sept. 30.

The VKI notes contain an interesting reference to VK0ED. The allocation of VKs to the Northern Territory should save wear on the Call Books now that that locality can be identified when heard. With beam north, what a scramble to look at the QTH when a strange VKs call was heard. All in the past now.

These comments from Dave IAWZ (Act. Sec., VKB Group) on "the proposed Radio Mirror Satellite Balloon are well worth digesting and exploring for action to be taken". As Dave writes, "I understand that this R.M.S. Balloon is of enormous proportions and that the prospect of some really long V.h.f. hops is good. I think that we all need to keep our eyes peeled on 50 and 144 Mc., the sooner the better. Just in case 'It' goes up tomorrow, as well this night. The July V.h.f. and T.v. Group meeting discussed shed ideas, some of the better informed believe that owing to the short period of time that the balloon will be away—some individual efforts between pairs of arranged stations will be the answer."

Stations interested should contact Dave LAWZ with proposed sked information or ask for an opposite number in VK3. The VK3 Group is really on the ball to obtain results, all can

NEW SOUTH WALES

General.—The June meeting of the V.H. and T.v. Group was held on 3rd June, with Les ZECN as lecturer. His subject "378 Mc. Equipment" drew a near record crowd for the Group, with 50 odd squeezed into the small room. Les had his xtal controlled vs. (QZQZ/378 Mc. final and QZQZ/40 tripler), xtal loc. and 378 Mc. C4, and 378 Mc. diode mixer and long tom Yag for demonstration, and the evening was voted one of the most popular lectures we have heard.

On Sat., with June, a working bee knocked down the wall between two rooms at 17 Acheson St., to give a lecture room which will accommodate about 70. The workers came from far and wide, with, I believe, one from Urunga, and Stuart 2ZDF, with Stan 2AYL, ex-2ZDI, from Newcastle.

The next activity for the Group will be a Treasure Hunt Field Day on 14th August. Details will be announced over 2WI on 14th Mc. on Sunday nights, together with details of the monthly Fox Hunt.

The logs for the Midwinter Contest are due in on 31st July. Please forward yours to the Contest Committee (2ZBX or 2ZKP) if you have not already done so.

Re Me.—No activity reported. JA cards have been received by IABR and SHE. The V.h.f. Group management committee have been thinking about stirring up activity on this band, and the possibility of simple pack set equipment for field day use is being explored. A report will be given in "A.R." next month of experience.

144 Mts.—Activity is again at a high figure and 30 stations or more report in regularly to the broadcasts and several newcomers or old timers have been noted.

Final field winners of the Autumn P.D. were 2ZKP (2,370 pts.), 2ASZ (2,165), 2OA (2,060). Home station honors went to 2AWZ (1,917), 2ZPG (786) and 2ZDP (776). As it can be seen, scoring was close, and the Contest Committee had a difficult time checking distances.

The D.F. F.D. held on June 12 was won by LAWZ. Second was EPM with ZER, and third ZECF with STAL.

NER is still measuring frequencies of stations he works, and the list is growing weekly. Good work, Phil! He is also reporting in after the broadcast on a frequency which is 100 kc higher each week, allowing an accurate check of rx calibration to be made.

576 Me.—Activity has been spurred by SZCN's lecture and feverish building is the order of the day (or night). A snoop around the "development laboratories" has yielded a little information about progress and designs. Here is a

bit of it. Z2F has a xtal locked rx going. ZHL has the exciter going and the final finished. IHO has the mixer operating. But Ray is still short of the oscillator to the final and still needs a 100K resistor. Z2G and Z2H are following by a QRG03/20A final. Z2AC is going nicely with both tx and converter xtal locked. Z2CN is not happy with his converter and more work is going into it. Z2AG has the 2nd stage putting power into the 4X1000G tripler-final and hopes it won't be long now before 10w of 876 output is obtained. What about some more starters for this band. Here is a chance to do it. You can still use mental soldering. Iron-Z2AG.

SOUTH AUSTRALIA

Nell SZAW has decided to retire from his position as Divisional scribe after a fairly long period of approximately three years. On behalf of the v.h.f. gang in VK5 I would like to thank him for the sterling job he has done and it is hoped that the high standard he achieved can be maintained.

The mobile scene is somewhat brighter with Ron SMK heard quite regularly, trying out his new mobile rig for 50 Mc. Ron runs 300 to a 6160 final, screen modulated Gilbert 50K is still applying finishing touches to his new mobile gear for 5 and 2 mk. Stuart 5ZDG's mobile programme has been temporarily suspended until more urgent projects such as the wide band c.r.o. and new base station modulator have been completed. These active mobile stations include 5ZDR and Ned 5ZL who will regularly make cross-town trips, both during the week and at week-ends.

An interesting "round the hills" mobile duplex contact was recently had by AI 5ZCR, Gerry 5ZFM and 5ZBZ (mobile). Stirling was the most distant point reached and full duplex contact was maintained with AI except on one stretch of road which runs very low down behind National Park. Transmissions from the mobile were on 144 Mc., receiving on 50 Mc., and the power input on 2 was 30w. to 4/40.

Several new stations have appeared on 6 m recently, some of them having migrated from 1 m. They are Bill 5ZDJ and Barry 5ZDI. Geoff 5ZDQ, Murray 5ZCT and Viv. 5ZCC have been on slightly longer, but as they may not have been previously mentioned, they are also extended a warm welcome to the band.

John (ZC) has been more active lately after a long silence—presumably due to an extensive re-building programme in the shack.

Brian STB has returned after a vacation in VK1 and still offers some c.w. practice to those who desire it. His services are very much appreciated, particularly by your scribe. Doug SKK has often helped also but the lure of those rare ones on 10 mhz has kept him off 8 mhz lately. —8ZBZ.

WESTERN AUSTRALIA

The last meeting of the v.h.f. gang was held as usual on the fourth Monday. The lecture was provided by Frank SCC who discussed some interesting points in higher maths. It is proposed that the club station, 8VF, participate in the 1961 National Field Day in Feb. This should create quite a deal of interest, especially as the contest is open to ten years and over. VKA was represented. A committee has been appointed to go into the why's and wherefores of the matter.

80 Mc, shows signs of increased activity, both local and DX. JAs were heard at readable strength on at least two occasions. HLKX and also those high power x.t.y. stations (48.53 and 48.5 Mc, approx.) made appearances. No DX was worked however. Some interest has been created by Noel 6ZBG's experimenting with transistor tx's and rx's. Remarkably good reports were received.

Heard 82ZG working transistor/portable with 48U one day. 6BO still mobile/uses on his way home from work. The main other activity is provided by 62BZ-62BY with their regular skeds. 8CL has re-appeared with a Geloso v.f.o. 6 mxr rig with 1445 120w. final. Signals were quite fair on a test conducted with 6RE, An-

Television.—Main item of interest here was the reception of Adelaide Channel 2 in a Perth workshop on the morning of July 1. A test pattern was being transmitted at the time.

Some very interesting information has been received in letters from Mr. George Petersen, of Ayr, Qld. Mr. Petersen has received confirmation of t.v. signals received from Harbin, Vladivostok, Korea, and Kona. Frequencies vary from 49.75 to 61.35 Mc. Sound has been heard also.

We are expecting some very interesting results over the high Σ period of Christmas and New Year, especially in the lower signal areas

There still appears to be very few reported instances of t.v.i. in this State. A test conducted with 6HE and Les Cloud failed to reveal any signs of trouble even with ABW3 off the air and using 3I Mc (3rd harmonic). T.v.i. in Kalamunda works in reverse as far as 6 max is concerned, with ABW3 putting in very full

General.—The Sea-power gang now includes 6BW (0.1w.), 6ZBG and 6RW—hi-power with 0.5w.—modulated. (Here's one for the experts, can't be grid, plate or screen modulated, can it?). Some very good distances have been covered—particularly on 40 mx. 6RW.

TASMANIA

May and June, nothing was heard, worked on v.h.f. information received at any time. A carrier was heard on 50 Mc. one night when the VKs were coming in on short skip but as to who or what it was there is not a clue.

Was yarning to VK6ED on June 12. He has his 50 Mc. gear in going order and is building a five element Yagi to run skip.

Later on I work the Davis boys quite a lot on 14 Mc., so if they keep their interest up down there I shall keep the gang posted.—T.L.

[illegible]**Phone: 57-6387**

VICTORIA

The general meeting of the Division was held on Wednesday night, 8th July, when Dr. Jim Goding, VK3ZGG, gave us a very interesting talk on Medical Application of Electronics. Jim outlined various medical conditions, or rather normal physical conditions, and explained them in electronic terms, and as it were, in layman's terms. It was very good. We all know what feedback is electronically speaking. If that happens with certain disease conditions, the results are more permanent. Due to the lens of the projector not being available, we were unable to see more of this feedback, and as a layman was not around, the boys were interested in what Jim had to say. Thanks Jim.

The main doors were then opened to admit all the talent agents who had learnt of this vast reservoir of humour that was present at these meetings. And they were not disappointed as the usual rapid, raucous, and enormous crowd of well-dressed conference attendees from the previous minutes had been read. It is simply amazing the way in which some people obtain publicity by moving provocative motions. But a counter motion was adopted and the hall was filled with the usual "masterly inactivity," so they receive the usual prompt treatment. Applying to questions, the President stated that due to certain complications regarding party walls, the re-building of the Statute Rooms has not yet been commenced.

In addition, the administration of the Institute was being reviewed and steps were now being taken to improve the various tasks carried out by the Admin. Secretary, Council were also progressing with their plans to make the Institute more attractive to club members (what was being termed "clubbification"). The findings of the sub-committee regarding the allocation of frequencies by an independent authority was read to the meeting. Then followed reports regarding fox hunts, v.h.f., and all other subjects which were of a general business nature. It was an enjoyable night, but not for one member present.

Wednesday was the meeting night. Perhaps this was uppermost in the mind of our friend, but he completely forgot the significance of the date. Because of this, he called on a fellow Amateur known to possess a friendly spaniel with a well furnished kennel. It is not recorded whether he was forced to go, but we know that there are no good behaviour remissions likely and the first twenty years have been well and faithfully served. The Institute, Publications Committee, and everyone offer congratulations to yourself and Helen on this im-

To the consternation of all present, the meeting closed at 10.30, this was a catastrophe, because no one knew how to explain to their XYL how they could get home so early. She would never believe that the other meetings finished so late. But this problem was easily solved, everyone just stayed until the normal time holding the usual after-meeting conference so the meeting closed at a later hour.

Card Readers.—The Division is in the process of obtaining a new Card Reader. If you desire one, please list the Admin. Secretary know at JA 3538 or P.O. Box 36, East Melbourne, or let me know after the broadcast, or Michael ZEDD on 6 m. Price 30/- each, and if you wish one posted add an extra 1/- We must know if you require one within a fortnight.

Playback Check.—Ron 30M has a permit from the P.M.G. to allow playback. He has his own collection of tapes to anyone requiring a check. He can be contacted most nights on 80 m. Thanks, Ron.

VRS COUNCIL NEWS

Material from F.E. including the minutes of the Extraordinary F.C. meeting were ratified by VRS Division 1. The V.K. policy, in relation to v.h.f. bands, i.e. 6 m μ and up, is to consent to reduction in bandwidth rather than frequency shift. It was proposed that 50-54 Mc. be 50-50 Mc. in lieu of 50-54 Mc. However, we would prefer 50-52 Mc., which is a reduction but still in the International frequency plan. For 54-56 Mc. we would like a 140-150 Mc. but again a reduction to 144-148 Mc. would be preferable.

The advantages of having the internationally used frequencies for V.K. are obvious, with moon, balloon and other kinds of bands in progress at the moment.

The resignation of J. Lancaster from Council Secretary was accepted. Jay is now General Secretary.

Discussion also centred on getting 3WI on the air as soon as possible. Time being more important than volunteers, it is better to incur expense in the erection of poles, etc., and get the job done.

Council also decided that as soon as it could be arranged, a six-week concentrated slow Morse course be transmitted for say half an hour every night on 8 and possibly 2 mcs.

EASTERN ZONE CONVENTION

Phoenix rising from the ashes is kid stuff compared to the awakening of interest in the Eastern religions. It is my guess that as an individual, the Atonement might feel that he is all alone with his hobby and its attendant problems, but when he meets, becomes organized and talks over things with his fellows, great things can be accomplished. Such was the feeling I received at Traralgon the other week when JAKJ and myself made the trip.

Originally, 50 odd bods were to have arrived, but due to one thing and another, only 30 or so made it. As can be imagined a resurrection involves quite a deal of verbiage and the old faces and reminiscences combined made one feel that the spirit of Amateur Radio will live for a long time.

However, wipe the tear from thine eye and I'll press on. No one argued about the fact that the zone has come to life and without any ado the undernamed became cogs in the machinery. President, David 3DY, Snr V.P., Cliff 3AIT; Jnr V.P., Jim 3ZBV, Sec.-Treas., Stan 3ZAB, Zone Organisers, 3ZAB and 3QZ; Zone Stations, 3AIT, 3DY, Notes Correspondents, 3ZGV and 3ZBR.

The experience of the dinner had to be tasted to be believed and our very sincere thanks was voiced to those OMs, KYLs and YLs who made it what it was.

If the zone correspondents will write me with list of activities when and where and all other details, I'll get it to ZANE for the Broadcast and if far enough in advance, for the magazine

Next Convention? March 11, 1901, at Yarram.
Among those present were the following
apologies if some are missed: 3PR, XYL and
harmonics, 3BB and XYL, 3JZ, 3AKJ, 3AJL,
3TU and XYL, 3ZAQ, 3QH, 3DV and XYL,
3ZDP, 3ZBV, 3ZFO, 3TH, 3AWV, 3ZAB, 3QZ,
3ZGV, 3AIT, 3O Mmnd XYL, 3ALK, Les Dale
and XYL, Alf McKnell, Jack Williams, Mrs.
Scott (XYL 3SS) and a couple of names I
can't decipher. John and Keith Robertson

[illegible]

The annual meeting of the Zone was held during the Ballarat Convention. Kevin JAKR was elected President and the other office-bearers are: V.P.s, Jim SAST and Bob SIC; Sec.-Treas., Don JAKN; Committee: Brian SKN, Brian SZBS, Gordon SAGV, Dick SABBK, Chris. JAXU and Neil SHG.

The zone's only income is from rebates on membership fees, so a little recruiting occasionally would help to boost our finances. How about aiming for 100 membership this year, eh? More slow morse practice was again under discussion as five members have asked for it. If there are any more in the Zone who want this service, the committee or secretary would like to hear from you. During the year, three A.O.L.C.P. members have made the grade to A.O.C.P. and welcome them: SGN, Peter and Tony, and JWB. The QRN is now up to 100. The JNA is in the quarter and the

The Convention was organized by Brian ZLS in a masterly manner and the Zone is indebted to him and his helpers.

The National Field Day passed almost unnoticed by the Zone which is rather strange in view of the fact that it contains the country's top emergency nets. Perhaps if mobile stations were worth a little more than portables? However, one certificate did unexpectedly and a claimant to the Zone

The Warrumbold 8 mm net (3ANQ, 3ARJ, 3ZPG, 3PKI) seems to be lacking a little since the 3ZPG net has not yet arrived. Even 3ANQ has been heard on 40 m; Peter is mobilising in VKS with a vest pocket rig running and waiting for the 3ZPG net to arrive. The 12AU7, 7E6, 3XN finally given up the quarter wave semi-vertical/semi horizontal which the storm left and hopes to be able to use the 3ZPG net. The 3ZPG net has a chance of loading up that horizontal all-band rotary quad that eludes by the laundry down the road. The 3ZPG net is being used on the tanker "Alvenus". Pete was QSOed on 80 m, both phone and c.w., on his way into Geelong and the 3ZPG net was used to listen to the weather allowed "Alvenus" to berth at the refinery while all one could hear on 80 m was "there's a little bit of rain". The 3ZPG net was the spotlight. On the 3ZPG net.

the Gulf mainy contacted Pete. Pete's QRA is C/o. Radio Officer, Tanker "Alvenus" C/o. Navigation and Coal Trading Co., 22 Billite St. London, E.C.3, not the HP Bureau.

Neil JHG tried his s.s.b. out on the Sunday 80 mx post mortem. It works, too. Neil also was heard knocking over the 8X on 80 mx during the "CQ" Contest. BU 3XR has at last got the a.c. into his power supply and been heard talking about a kw. or so, when the rectifiers stop blowing up. Kerry JAXT has found 80 mx also with his 1.5 signal.

The O.T. set on 40 mX seems to have lapsed with the passing of Skene 255 many moons ago. Leigh 311 has been chafing therma about in QRP aircraft. There was a beauty a while back over the Grampians Leigh! How about taking the mobile up? Pat 3ADN has built a new antenna couple and starting to make a few more. I guess he and the 311T has been talking about v.f.o.'s. The monster there apparently no longer rules the roost. You really must fix that D.L.O. too, OM. John 3AGD is reported to be using a new chariot for his mobile. Sounds a nice outfit, John.

The next Zone W.I.C.E.N practice is on the 23/6/99 on 80 mx and we hope at regular in-

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tervals after that. Anyone interested is welcomed whether members of the Institute or not. Also please, more on the Zone hook-up. We all Amateurs wishing to take part in the Zone hook-up should contact John SAKP up to the minute for the Divisional Broadcast. JAKN

PRELIMINARY ANNOUNCEMENT from John JAGD in connection with the Boy Scouts Jamboree of the Air, to be held from midnight 31st Oct. to midnight Sunday, 23rd Oct. G.M.T. John asks that all Amateurs wishing to take part contact their nearest Scout Group and offer their services. John will be on the air if you make some spare nights to tell us all about it. S.W. Zone members will no doubt be particularly active!

WESTERN ZONE

I wish to thank Metv SAFO for writing up the notes in last month's magazine, also Gordon SGW for all work he has done for our Zone in answering W.I.A. broadcasts and other meetings during last couple of years.

Keith SAKP has recently completed his mobile to, using a transistorised power supply, but as yet he has not finished the convertor which he is putting in front of the car radio.

Another Keith, SQG, who happens to be our newest fully fledged W.I.A. at present is buying winding transformers, so guess we will hear him in the near future.

MOOREBARN & DISTRICT RADIO CLUB

At the June meeting of the above club it was decided to do something to encourage new members, both junior as well as senior, and with this in mind, George 3NQ, who is well known as an instructor of electronics at the Melbourne Technical College, evolved a schema of instruction for members who have not as yet passed their A.O.C.P.

The schema involves a course of instruction in theory and in practical basic electronics, and is so designed that members will receive the necessary tuition to bring them to the A.O.C.P. standard. Limited Licence.

The course will be conducted by George himself, and the practical by Bill 3YE. The theory on a Wednesday evening and the practical on a Thursday evening, starting in September.

The course will be free to members, because as George puts it, we are Amateurs and as such should not receive remuneration for any service rendered to our fellow Amateurs, or for that matter prospective Amateurs. Non-members may participate by simply becoming members of our club, the fee being nominal at 10/- juniors, and 30/- seniors, per annum.

Anybody interested, or anybody knowing anyone interested, in the district, should contact me, 3LC, at 1013 High St., Armadale, or phone 3Y3116 any time of day or evening, when I shall give them further information.

After the above, I have a number of notes on translator applications. This proved both interesting and instructive, especially the translator power supply and modulator.

The Whist Night held on Saturday evening, June 18, at the home of Arthur 3AWO, was a great success and enjoyed by all those who came along. Our President, 3AOK, gave a vote of thanks to our host and hostess who put on a really first class show. It was decided then and there to hold another evening in August, and Bob 3NZ kindly made his home and services available for that occasion. More will be heard of this later.

WANTED!

ARTICLES

Can you write an article for "Amateur Radio"? How about one for Hints and Kinks?

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MELBOURNE UNIVERSITY CLUB

At the Engineering Exhibition the other week the boys had the club station, 3ATM, set up as part of the electronics display. Stations on 40 mX were worked. Michael 3ZED appears to be the more powerful force here, and has been appointed as secretary to VK3 Division, we hope that he can last the distance!

QUEENSLAND AMATEUR RADIO CLUB

The Annual Meeting of the Club was held on Wednesday night, 29th June. Dick 3ABK, the Club President, occupied the chair and there was a good attendance. Members of the Club were given on the activities of the Club during the past year by the President and on the Club finances by the Treasurer, Ray Clark. Opportunity was taken to make some alterations and additions to the Club's constitution, bringing it more into line with present day requirements.

The election of office-bearers for the coming year was the final item on the agenda and resulted as follows: President, Harry Michael, V.F.A., Bob 3IC and Bill Huxin; Sec. Jim 3ABT, Treas. Vic Clark, Librarian, Eric Coxall, Auditor, Geoff Woods, Committee Bill 3BU, Peter 3IK, K. Victor, and Gerald Coxall.

A general meeting followed the annual meeting, with the new President in control. Members requested to receive in the correspondence the resignation of Jack Mitchell, Jack, who has been a member of the Club for many years, finds it necessary to discontinue association with the Club on account of work. A new member, Calvin Lee, was elected to full membership.

Peter 3ZAV reported to the meeting that there is a regular hook-up on 144 Mc on Saturday nights for those interested.

Club meeting, 6th July.—Two visitors were welcomed—Barry Smyth and Ray Howling, and apologies were received from 3BU, 3AFK and K. Vriens. The syllabus item was "Questions and Answers" and a number of really knotty problems were presented for discussion. Eric Coxall did a good job explaining points in rejuvenating and repairing an old but elaborate dual wave generator.

Club Exhibition.—An exhibition of Amateur Radio equipment will be held at the club rooms in Geringah Hill, Gungahlin, on Sept. 5, 10, 18th. A number of stations will be in operation and all listeners are asked to keep this function in mind. More detailed information will be available

QUEENSLAND

BRIISBANE AND DISTRICT

This month it is my sad duty to report the passing of another member of the Queensland Division, early last month we heard that Jim Currie, VK4LQ, of Caboolture, had joined the Silent Kays. Whether Jim was active on the bands or not, he always remained a member of the W.I.A., telling me in a letter while I was Secretary that he liked to remain a member for sentimental reasons. I say, with sincerity, that Jim Currie's passing is a great loss to the Division.

The Sunday "working bees" at Fred's QTH have been very well attended and we are beginning to clean up the outstanding disposals gear orders. If you're still waiting for items I assure you that it won't be long before you get your gear. We want to finalise this business as soon as possible before we release more gear.

It's amazing how these "L.V." bods' shift around! Frank 4ZCQ, came from VK3 from G land when I was down there and then shifted to Brisbane when I started here. He was the Technical Manager of a big service organisation and recently he retired; at this time he has gone to New Zealand and, I believe, his only regret about his shift to ZL is that he will have to concentrate on more since there is no limited Licence in New Zealand.

If you subscribe to "CQ" you have probably seen the Confession by Gary 3QJ. Guessing There have been some really good entries over the years it has been running, and in the

June issue I was pleased to see that a VK4 card, though not winning the prize, did reach the final and was printed. This was the QSL of Charlie VK4HQ and I can say if I was one of the judges who had the lot of 40V worth have been his card or the one from VE2VU.

Gosh, did you see the way our Editor, Ken 3ZED, "hook-me-daisy" got me down on the diodes. It started me thinking and thumbing through my library. The only thing I can say is that he was probably thinking of the type I had in mind, which has the p.v. of 80V, while the OA211 is rated at 800V, p.v. The OA210 is the beautiful little diode usually used in t.v. rectifiers. The 150V diodes on the voltage doubler circuit to give 360V, d.c. output. With the larger p.v. of the OA211 I can't see why it can't be used as I stated last month (1).

Members of the "con" have been busy. Department, Stan 4SA asked me if I was busy one Saturday afternoon recently and when I said I wasn't, he picked me up and we went to visit Albert 4LT, at Dromedary Repat. Hospital. The last time I had seen him was back in 1944 or 1949 and it was great to see him again. He is active again and we have his promise that he will come to a general meeting soon.

Back in Brisbane after a fairly long spell in the States, I am Col 4CI; he was very active in the west while he was out there and there was usually a large stack of QSLs for the Brisbane group. But from the time I got home, hope the circuits sent out with "QTC" are useful and would like to know what gear (disposable) you would like to have circuits of. I've sent with July "QTC" every two or three months and would like to know which ones you need!

TOWNSVILLE

The Publications Committee are to be congratulated on the July issue of "A.R." The column "The Hon. Gentlemen" said was of great interest to all members, there should be more articles of same, whereby Amateur activity is concerned, as this is the only way 40 mX can be used. The column "The Hon. Gentlemen" are useful and would like to know what gear (disposable) you would like to have circuits of. I've sent with July "QTC" every two or three months and would like to know which ones you need!

On the recent long week-end (Queen's Birthday) the local Amateurs held a picnic and the get-together was really enjoyed by all and the consensus was "There should be more of these."

Unfortunately, I was not present, as given the week-end off I took the opportunity to visit a collection of friends. The fact that Amateurs in the vicinity, together with some prospective members. Main cry was the non-arrival of "A.R." and who was to blame? Did my loss of the book to the post have anything to do with it? Never fear, chaps. This is the first of the making and the projected visit of the Queensland Secretary, Stan 4BA, in August will consolidate the position. Some of the few more offers offered to help out with the QSL chores.

Band conditions still sliding down the scale and little DX heard on the popular bands. The weather out on the Maitland, not so good, better luck next time. Reading the airmail conversations of the various chaps, only wish I could have many more of them. The wealth of information that is heard as concerns the various projects on hand and how they achieved their objectives. This information could be passed on to help out. See page 9 of "A.R." for July, and send them down the dops on your projects (it will be gratefully received). If you can't make the pages, you are only out 5d. for postage. Remember, all great men had many failures and some goes for authors before they make the grade.

Arthur 4FE says claims to be the first to work the new allotted VKs. This will certainly help the DX boys who are after VK awards and who work VKs before working the coveted Northern Territory. Bob 4WF heard on 1 Mc, speaking of arrival of new gear as he was in order to be duplicated and looking for someone to take the other when it arrives. Edgar 4GF heard on the air after a long silence and looks for the old time on 7 Mc.

Claude 4UK and his pupils recently paid the city a visit and just waiting for their call sign to be granted. He has a number of other Amateurs in Kyrr as there are in Townsville (hope so). Nick 4WT recently heard on c.w. Most of the local net heard, apparently having some parents who had the net on the lowest point of the cycle. The local Z boys are

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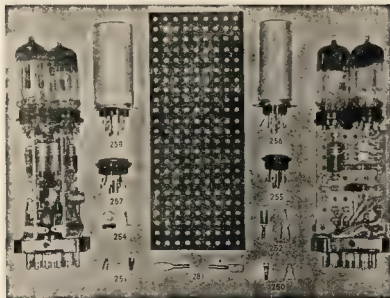
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take up canary breeding at Lucindale, and in the past view has purchased a new canary and sent back to wait for results. He certainly got results, in a manner truly worthy of Arch, the canary started to lay again! He is at present trying to decide whether or he has read about the birds and bees is all hooey, or whether he has been taken for a ride. Take him down to his bird room and see for yourself.

Hear Dave SAW from Penola in QSO with John 5DJ at Kingston the other early evening on 7 Mc. and their main topic was 288 Mc. activities. Dave SAW was very happy to hear from their talk about beams up on top of windmill towers, etc., etc. the 288 Mc. activities planning to do a little work. I hope the v.h.f. correspondent for VK3 does not read this paragraph, he will think that I am trying to riddle his thunder. As if I would! I heard 288 Mc. from Penola in QSO with Gordon SXU after the W.I.A. session the other Sunday, and from the conversation I gathered that George had attempted to emulate Compt 5EF by having some sort of a prang with his car. Fortunately nobody was injured, but it has taught George what a bad example Compt can be. Fancy letting a wife write VK3 notes at times. Max 5GP heard mobile on 7 Mc. as he was touring down the Anzac Highway on his way home, but didn't yell. A real meek and mild person, but I can't give any answer to my call. Don't often hear this call these days, but now that Max has suddenly been given the opportunity to work we should be hearing it often. George SGD also heard on 7 Mc. the other Sunday morning. This is another one who used to be always on the air, but I haven't heard him these days. Nice to hear your voice George. Lance SXL from Clare heard on the W.I.A. call-back recently and he is planning to be working being heard down in the city because he had forgotten to connect his aerial. No answer to this mystery as yet, but tune in next month for absorbing details of this mystery for the year.

As I write, the Elizabeth boys are announcing an expedition to the middle of Alice Springs beginning on 1 September until the 14th. This is somewhat belated news to most, but it is possible that a few have not heard and will be glad to have the opportunity to work what is now VK3. The expeditionists are Ben BFP and Jeff BNQ, with Bill BEW handling the arrangements at Alice and C.W. will be in charge of operation and although the paragraph might be a little late, it is possible that some of your DX friends might appreciate the mention of your next contest. This is really a double event, because not only it will be a Northern Territory contest, but it will also be a new prefix, VK3. Try it on some of your contacts, most will jump at the chance.

ELIZABETH AMATEUR RADIO CLUB

Seven years ago, Salisbury, a township some 15 miles north of Adelaide, was surrounded by pastureland. Today it has almost been engulfed by a new town—Elizabeth, with a population of some 17,000 souls. What more natural then, than an Amateur Radio Club to appear?

Five months ago the Club was formed, and has now become better known by the new town. Some of the members are: Bob 5BQ, John 5BQ, VK3 BFP, BBS, SDY, BEJ, BEV, BKD, SNO, BND, SDG, SQK, STM, SZCH and SZJM. The Club meets at 8 p.m. on the first Saturday of every month at the Elizabeth South School, and visitors are welcome. The busy-busy of sorting out a constitution, etc., has been done, and the members are affiliated with the W.I.A. (S.A. Division).

Very shortly the Club will be issuing a certificate for "Worked All Elizabeth". Details will be given later.

Every Monday evening at 7.30 C.S.T. the Club members have a "get together" on 40 Mc. BND, who has the best power output, controls the net.

— — —

WESTERN AUSTRALIA

The monthly meeting of the W.I.A. was again held at the Mends St. hall and had quite a good attendance. Everyone was finally ready after getting mixed up with an amateur gymnastic group and the Police Force—you see, some things hang round.

The meeting was quite a short one as there was not much business to discuss, after which Cole 6CS took the floor and gave us a lecture on how to use a radio. This was very good. Cole explained the various types of deafness, the reasons and remedies, then went on to explain how the degree of deafness was measured and the use of an audiometer. This demonstration how the earpiece was made. From this Cole explained the assistance of Dennis Cook who was very willing, QRX, at least I

think so, for Cole had mentioned that sometimes the place could break the ear. Anyway, Dennis made himself comfortable on the table, closed his eyes and I think began to pray silently while "But—", I mean Cole, went to work on Dennis. It did come out of the ear in one piece and Dennis has recovered 100 per cent.

I was not present at the monthly Council as I had to go over to VK2 on business, so I cannot report on the meeting till I find out what went on. I was very interested in the work of Ron 4KW. I guess nobody walked off with the "150 watt table toppler," anyway, better luck next time, fellows.

Before I went away I went and saw 4RW and his QRP transistor rig. The whole thing is about 6 x 4 x 3 inches and runs less than 1 watt and does not need a band of earth giving a good signal which seems to be all modulation and no carrier, but Ron is not happy with it because it is controlled and being such small power he finds it very hard to make contact, but once having made contact is 100 per cent. stick to it, Ron.

While I was away I wanted to visit all the VK3s I had worked, but no matter how I tried to get away from the clutches of the firm, I could not, but one evening I gave them the slip and went to see Mark in Kingsford. I took along a friend who was also interested in Radio. On arrival, I knocked on the door and was welcomed warmly by producing my QSL card, but Mark did not seem too happy to see us, but when he saw the card his color came back, his breathing resumed and some remarks were made. I was weak, "Come in." You see, Mark is a taxi driver and if you have been to Sydney you will know that finding a taxi there and there we looked like a couple of detectives. Anyway, after liquid refreshments, we saw the mighty 6 watt rig which does such a grand job on every QSL. Mark has worked Europe, the States and many other countries on phone, and soon his XYL will have her visit.

Many of us have tried in vain to get our XYLs to take an interest in Amateur Radio, well Mark has the solution, build the rig in your bedside table, move into a small flat, sure to be early in the morning, turn on the sheets; this will keep the XYL awake, and as Mark's XYL says, "If you can't fight it, join it." Now when your XYL leaves you to contact Mark, he has the solution to give as he is very happy. Mark uses a ground plane on the roof of his flat and has four t.v. antennas around it. This has to be t.v. So 73 to you Mark and your XYL, from us all here in VK3. "Don't forget 80."

I hope to stand still in one place long enough this month to bring you more news on VK3 next time chaps.

TASMANIA

Remember, the R.D. Contest. We want a leg in front of you, and that means you, so that we can retain the Trophy. Last year we won because of the high percentage of participation of VK3 Amateurs in the Contest and the excellent return of logs. Better luck to us all, this year. Best of luck in the Contest chaps.

Jack TB1 is re-building his rig to overcome the problem of the 200 watt set. He is going to be back on the air in time to iron out the bugs before the Contest. Jack is also building a hi-fi set, using a pair of EL4s in push-pull, and a 6X4 for the detector. This will work very well indeed. Den TDK made a quick visit to Hobart late in June but lack of time did not permit him to talk to the shikra around the town. Better luck next time.

Keith THX and Doug TDW are very pleased about working K6GIC, who was spending 48 hours in Hobart on his way to the University of Marcus Island, wherever that may be. Myles TMF should have his beam up and his rig ironed out in time for the R.D. Contest, and no doubt you will QRZ me Myles, keep it up, too.

A very important and far-reaching matter was brought up at the June meeting at the behest of your Council. The subject matter was the commencement of a fund, either by direct giving, or interest-free loan, or low interest-bearing loan, to provide a fund to apply for the eventual purchase of a VK3 headquarters. The idea received general sympathetic acceptance and suggestions were advanced with the idea of getting the necessary finance. Can you help in kind or with ideas? It is a very important matter, please do not let it pass by.

Activity during June was very slight, due to several causes, the introduction of t.v. to the South, the very cold weather, and the appalling band conditions almost every night.

80 mc was the only band to reward activity, and it was most gratifying to find so many new Amateurs using c.w. on that band, and in most cases it was beautiful code to read. Many Amateurs of much longer standing could probably follow their examples.

Application is being made to the authorities to allow re-radiation of the Divisional Sunday morning broadcasts on both the 40 and 140 Mc. bands, so that the v.h.f. will be able to share in it. The date for the opening broadcast is not yet known.

Charlie THS had the misfortune to drop the limb of a tree across the elements of his new beam. If you had left them bent Charlie, the pattern could have been quite interesting.

NORTH WESTERN ZONE

My, how the time does fly! Another month gone by and what have we achieved. Yours truly has obtained some dope, etc., made a few calculations, etc., and gathered unto himself a few more bits and pieces; all with respect to firing up some 325 gear on 7 mc. Now about a few zone members letting me know something of their doings. Dennis TDR has something of his feet line; I did look strange with one side hanging down like a tuning stub; also he has peaked the Eddystone on 20 mc and is vainly calling CQ VK8. Max TMK has peaked himself a huge modulation wonder what he will sound like with plate modulation; I guess he will still be the same old Max.

Our next meeting was held on the fifth of July at the usual place and fourteen members were present. A tape was played accompanied by music, then the contest of the t.v. receiver, from start to finish. Suppose we always partaken of and enjoyed; likewise the washing up afterwards.

Quite a discussion was held re the mobile gear for the Burnie Fire Brigade and the two mobile units were returned with their receiver sections duly wired up. It really looks like the project has a chance of being done again. Hope I will be able to report completion of the mobile units in next issue. Thanks go to Ray Schulze and David TMS for the constructional wiring to date.

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